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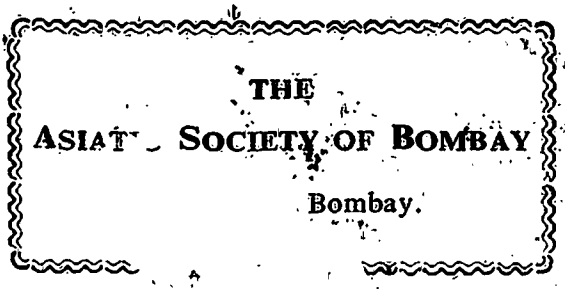

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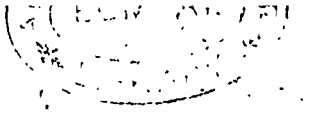

THE

NATIONAL CYCLOPÆDIA

OF

USEFUL KNOWLEDGE.

VOL. XIII.

ABADDON——ZUINGLIANS.

SUPPLEMENT.

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PREFACE.

The National Cyclopædia was originally founded on the Penny Cyclopædia,—a work which occupied thirteen years in passing through the press, and incurred an outlay of 40,000*l.* in literature and engravings alone. On its completion the present publication, in twelve volumes, was undertaken by the same spirited proprietor,—the first volume appearing in 1847, and the last in 1851. In this improved serial were embodied not only the substance of the Penny Cyclopædia, but likewise the valuable materials of its two supplementary volumes, with such curtailments and improvements as those materials appeared to require.

Owing to the extended patronage which the National Cyclopædia continued to enjoy, another re-issue was soon afterwards determined upon, with such additions and amendments as time and circumstances might have rendered necessary. In the onward course of time all things are changing. In History, Politics, Geography, Statistics, and Biography,—in Agriculture, Mechanics, Arts, and Sciences,—new phases are perpetually presenting themselves. Empires are overthrown, and ancient dynasties annihilated. New kingdoms are founded, and fresh colonies planted. Political institutions become changed, and the antiquated jurisprudence of other ages passes away. The population and general statistics of the whole world are undergoing perpetual mutation; and the ever-active energies of human genius are constantly bringing to light the great secrets of nature and art. In the mean time inexorable death is daily sweeping off the most intellectual and the most exalted of every land, whose genius or whose virtues have to be recorded in the cyclopædic pages of the biographer. It has therefore been found necessary to issue a Thirteenth or Supplementary Volume, which comprises, under a distinct alphabetical arrangement, all the accumulated information of the previous ten or twelve years. Many articles, entirely new, have been written; and all the leading subjects of the twelve preceding volumes (especially

those of a biographical, historical, statistical, geographical, juridical, or social character) have been carefully written up to the present time. Hence the Supplementary Volume alone comprehends nearly 2700 articles, replete with varied and useful information.

The entire work now consists of Thirteen Volumes, the thirteenth being supplementary not only to the National Cyclopædia but to all Encyclopædias whose contents, from the lapse of time since they were first published, have become antiquated, or altogether obsolete.

Of the various subjects on which the writers have treated, or which have been brought down to the present period, the following may be noticed:—

AGRICULTURE — comprehending Husbandry, Rural Economy, and Gardening.
ANATOMY—Physiology, Medicine, Surgery, &c.
ANTIQUITIES.
ARCHITECTURE and SCULPTURE, Civil and Ecclesiastical.
ARTS — Inventions, Trades, Manufactures, etc.
ASTRONOMY.
BIOGRAPHY.
BOTANY.
CHEMISTRY.
GEOGRAPHY and TOPOGRAPHY.
GEOLOGY and MINERALOGY.
HISTORY — Chronology, Epochs, Dynasties, etc.
LAWS and GOVERNMENT.
LITERATURE — Philology, Poesy, Education, etc.
METALS and METALLURGY.
MILITARY and NAVAL AFFAIRS.
PHYSICAL SCIENCES.
RELIGION—Priests, Doctrines, etc.
SOCIAL, POLITICAL, and DOMESTIC ECONOMY.
ZOOLOGY, etc.

P. A. NUTTALL.

LONDON: *June*, 1859.

SUPPLEMENT

TO THE

NATIONAL CYCLOPÆDIA

OF

USEFUL KNOWLEDGE.

ABADDON.

ABAD'DON (Heb. אבדן destruction); a name given in the Apocalypse to the angel of death—the destroyer. In other parts of the Scriptures it signifies the place of destruction, equivalent to the Greek Hades, the grave, or region of death.

ABBA, a title given to the bishop of the Syrian, Ethiopic, and Coptic churches. The bishop of Alexandria is still styled Abba by way of especial distinction. In the Chaldee, Hebrew, and Syriac languages, the word signifies "Father," and is expressive of confidence and attachment. It was in this sense that St. Paul (Rom. viii. 15) uses the word, "ye have received the Spirit of adoption, whereby we cry, Abba, Father." The title was held in so much respect that it was not allowed to be used by slaves when addressing the head of a family.

ABBEYS (i. 17). After the Norman Conquest these religious communities acquired great wealth and importance in the state. The heads of them were more like independent princes than subjects of the realm. The mitred abbots were lords of Parliament and peers of the state. Such vast possessions had these institutions contrived to amass during the darkness of the Middle ages, that previous to the Reformation one-third of the land and of the benefices of England were appropriated to abbeys and their religious foundations. On their dissolution by Henry VIII., there were suppressed, in England and Wales, 643 abbeys and monasteries, 2374 churches and chapels, 110 hospitals, and 90 colleges; and their annual revenue amounted to 2,853,000*l.*; which, at the present value of money, would not be less than ten millions per annum. Although these abbeys were often the repositories of learning during a barbarous age, yet these advantages were seriously counterbalanced by the manifold evils thence arising; for the superiors of some of the

ABDALS.

richest endowments were Italian priests, residing in the papal states; and a great portion of their enormous revenues went to the treasury of the Vatican. The wealthiest abbeys, however, were in Germany; and the most splendid was that of Fulda, or Fulden, situated near the town of the same name in Manconia. This abbey was founded by St. Boniface, in the year 784, and belonged to the order of St. Benedict. Every candidate for admission was required to prove his nobility. The abbot was elected from one of their own number, and became by virtue of his office archchancellor to the empress, and prince-bishop of the diocese of Fulda. But this abbey, with all its princely immunities, like hundreds of others, was swept away at the great Reformation.

Notwithstanding the many social evils attendant on overgrown religious institutions, these abbeys had their national uses during the barbarous periods of history. They were the repositories as well as the seminaries of all the learning of the Middle ages; and the historians of this country are chiefly indebted to the monkish chronicles for the knowledge they possess of national events.

ABBOT OF FOOLS, in the Middle ages a sort of histrionic character, or leading buffoon, for conducting the religious festivals, games, and mummeries of Christmas or Shrovetide. He was a kind of master of the revels; and the amusements over which he presided were evidently derived from the Saturnalia of the classical ancients.—The *Abbot of Unreason* or *Misrule*, and the *Boy Bishop*, so well known in England, Scotland, and France, were elected at the festive seasons of the year for the performance of the same hilarious duties.

ABDALS, the name of certain Mahometan fanatics in Persia, who, in their excess of zeal, sometimes ran into the streets, and attempted to

kill all they met with who were of a different religion. If they happened to be killed in their mad sallies, they were looked upon by the vulgar as martyrs.

ABDICATION OF SOVEREIGNS (i. 23). This means a voluntary resignation of the sovereignty on the part of the holder. When this is performed in favour of another it becomes an *act of cession*, and when rendered compulsory it is no longer an abdication. Thus many writers have confounded these terms. Perhaps Diocletian is the most striking instance to be found in either ancient or modern history of an abdication. He resigned the dignities and retired to Salona. He occupied his leisure in superintending the building of a palace at Spalato, a place about 3 miles distant. This occurred about three hundred years before the Christian æra. He spent much of his time in his garden, and when urged by Maximian to re-assume the purple, he replied, "If I could show you the cabbages I have planted with my own hands at Salona, you would no longer urge me to relinquish the enjoyment of happiness for the pursuit of power." This was a remarkable answer from one that had wielded a sceptre.

In modern times the abdication of Christina, queen of Sweden, is perhaps the most memorable. The Emperor Charles the Fifth merely resigned in favour of Philip. James the Second of England *deserted* the throne, and it was then declared vacant, while Napoleon abdicated twice upon compulsion, and his successors, Charles the Tenth and Louis Philippe, both formally abdicated, when power had been torn from their grasp.

Charles Albert, king of Sardinia, after the battle of Novaro, fought on the 24th of March, 1849, resigned his crown in favour of Victor Emmanuel, and retired to Oporto, where he soon after died. On the 2nd of December, in the previous year, Ferdinand, emperor of Austria, abdicated in favour of his nephew, Francis Joseph.

ABE'LIANS, A'BELITES, or ABELO'NIANS, a primitive sect of Christians, who chiefly existed in the diocese of Hippo, in Africa, in the fourth and fifth centuries. Like the modern Shakers of America they interdicted sexual intercourse, and although marriage was allowed they regulated it after the example of Abel, who, they pretended, died without ever having known his wife. They maintained the sect by adopting the children of others.

ABERDEENSHIRE (i. 36-44). According to the census of 1851, the population of the county was 212,032; registered electors 3540; area 1,260,800 acres. Balmoral Castle, the autumnal residence of queen Victoria, is situated in this county. The population of the principal places, in 1851, was as follows:—

Aberdeen	71,973
Inverury	2,649
Kintore	1,342
Peterhead .....pa.	9,429
—— ... .t.	4,819
Fraserburgh.....	4,447
Huntley	4,061
Rosehearty	844
Turriff.....	3,584

ABINGER, LORD (JAMES SCARLET), a distinguished lawyer and statesman, who, for many years, was a leading member of the English bar. He was born in Jamaica, in 1769. His abilities, as a lawyer and a scholar, were of the highest order. In 1834 he was raised to the bench by Sir Robert Peel, and shortly afterwards created a peer of the realm. He died in 1844.

ABOL'LA, a kind of pallium or cloak, worn by the Greeks and Romans in following the camp. Even kings appear to have used it.

ABRAN'CHIA (Gr. *α* without, and *βράγχια* gills), an extensive family of Vermes, constituting the third order of the Annelides, according to Cuvier. They comprehend the Lumbrici, or common earth-worms, and the Naides, or aquatic worms, of Linnæus. They are divided into two families, the *A. setigeræ* and the *A. asetigeræ*, the former having the setæ (or rough hairs), and the latter being without. They have a closed circulating system, usually filled with red blood, and also a knotted nervous cord. They have no apparent organs of respiration, and appear to respire, some, like the earth-worms, by the entire surface of the skin, and others by internal cavities.

ABRANTES, ANDOCHE JUNOT, DUKE OF, one of the most distinguished generals of Napoleon Bonaparte. He was born in 1771, and entered the army as a volunteer in 1791. He was first brought into notice at the siege of Toulon, where he was employed as a lieutenant, and was so fortunate as to attract the notice of Napoleon by his coolness and courage. In 1806 he was made lieut.-colonel of Hussars; and Bonaparte appointed him to the command of Paris. In the following year he was placed at the head of the army in Portugal, where he remained two years, and was then honoured with his ducal title; but being defeated at the battle of Vimiera by Sir Arthur Wellesley, he was compelled to capitulate. He subsequently served in Spain, and was made governor of the Illyrian provinces. He died in 1813.—His wife, the Duchess of Abrantes, who, on the fall of Napoleon, was obliged to live by the labours of her pen, is distinguished in literary history by her celebrated "Memoirs," which had a very extensive sale.

ABRAX'AS, in archæology the name applied to those antique stones or amulets which were very common during the third and fourth centuries, and are still to be found in the cabinets of antiquarian collectors. They received their name from the word *abraxas* being engraven upon them; though their particular object appears to be involved in doubt. In all probability they were intended for a mystic or religious purpose; as the names of angels or saints, and sometimes Hebrew, Greek, or Coptic inscriptions, are found engraven upon them. Many of them were brought from Egypt; and from the circumstance of the figures of Apis and of Isis being occasionally represented thereupon, we should be induced to suppose that they were connected with Egyptian as well as Christian mysteries.—(Nuttall's *Archæol. Dict.*)

ABSORPTION (i. 69-71). We have already de-

scribed the important functions of ABSORPTION in the *animal* economy. We shall now proceed to explain those of the *vegetable* creation.

Absorption of Plants, or Vegetable Absorption.—Plants, like animals, require food for their nourishment and support; but not being able to move from their station in search of it, they are furnished with numerous mouths, called absorbents, which they slowly stretch out into the soil. These mouths are placed at the tips or points of the root-fibres, and consist of minute sponges or suckers, which take in food from the soil, whence it is carried up through the plant to the leaves, and spread out on their surface. This vegetable food, on being exposed to air in the light, parts with two-thirds of its water, and consequently becomes thicker. It then descends through the various parts of the plant to supply materials for growth, precisely as the blood, after being purified by the lungs, is distributed through the animal body. To sum up the absorbent processes in the words of Henslow,—'Plants absorb their nutriment by the roots; this nutriment is then conveyed through the stem into the leaves. There it is subjected to a process by which a large proportion of water is discharged. The rest is submitted to the action of the atmosphere, and carbonic acid is first generated, and then decomposed by the action of light. Carbon is now fixed under the form of a nutritive material, which is conveyed back into the system; and this material is further elaborated for the development of all parts in the structure, and for the preparation of certain secreted matters, which are either retained within or rejected from the plant.'

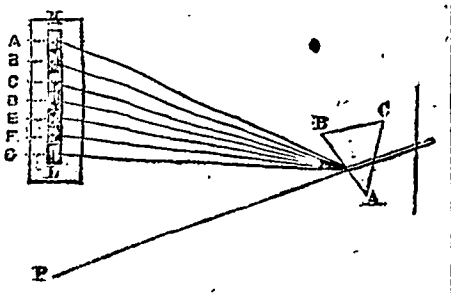
In the system of absorption it appears to be almost a general law, that the roots of perennial plants stretch out into the earth in proportion to the growth of the parts which are above ground. Thus the roots of many climbing plants, such as honeysuckles, passion-flowers, &c., extend horizontally about as far under ground as the branches stretch above ground; while annuals, such as the poppy and the ten-weeks stocks, not having the capability of extending their roots, are soon thereby rendered incapable of obtaining sufficient nourishment for the stems, leaves, and flowers. Thus the duration of a plant will materially depend on its natural capability of extending its roots into fresh soil, and also on the facility with which such extended roots can penetrate into fresh soil. A knowledge of these principles is of great importance in floral and horticultural pursuits.

Absorption of Caloric is one of those principles in physics, which, like the absorption of plants, presents some curious phenomena. If we heat a quantity of water in a strong phial, closely corked, till its temperature rises ten degrees above the boiling point (212°), we shall find, on drawing the cork quickly, that a small portion of water will rush out in vapour, and the temperature of the remaining fluid will sink instantly to 212°. Ten degrees of caloric have therefore been absorbed by the quantity of vapour that escapes. The experiment has been carried still further. By heating water under the pressure of a strong iron vessel, we may raise its temperature to 400°; yet, when the pressure is removed, only part of the water is converted into vapour; and the temperature of this vapour, as well as that of the remaining fluid, will be no more than 212°. It therefore follows, that 188° of caloric must be absorbed in an instant by the formation of the vapour, which has no effect on the thermometer. The absorption of caloric, which thus accompanies vaporisation, is not owing to its entering into any chemical combination, but to the enlarged capacity which the body acquires by a change of form.

Absorption of Gas is said to have taken place when muriatic acid gas is thrown into water, and the water becomes acidulous. When a gas loses its gaseous properties by combination, it is said to be absorbed; but when we speak only of the condensation of gas, by cold or pressure, the above term cannot be employed.

Decomposition of Light by Absorption is another great principle in nature which requires further explanation. One of the noblest discoveries of the 17th century was that made by Sir Isaac Newton respecting the composition and decomposition of light, and the cause of colours. He demonstrated that white, which appears to be a colour so pure, was the result of the seven primitive colours mingled together in a certain proportion. The prism, an instrument then little understood beyond that of being a mere object of curiosity, was the agent employed by Sir Isaac for the decomposition of light. From various experiments this great philosopher arrived at the conclusion that the light of the sun contains the seven primitive colours; and that these colours are formed by the rays experiencing different refractions. Subsequent investigations have tended still further to elucidate the important principles on which the absorption of colours, and the decomposition of light by absorption, are founded. It is discovered in practice that a certain portion of light is lost in passing through bodies the most transparent. This loss may be attributed to two causes; one is, that a portion of the light is scattered in different directions by irregular reflection from the imperfectly-polished surface of particular media, or from the incomplete union of its parts; while another and generally a greater portion is *absorbed* or stopped by the particles of the body. On examining the action of coloured fluids in absorbing light, many remarkable phenomena present themselves. 'If we take a piece of blue glass (says Sir David Brewster) like that generally used for finger-glasses, and transmit through it a beam of white light, the light will be a fine deep blue. This blue is not a simple homogeneous colour, like the blue or indigo of the spectrum, but is a mixture of all the colours of white light, which the glass has not absorbed; and the colours which the glass has absorbed, are those which the blue wants of white light, or which, when mixed with this blue, would form white light. In order to determine what these colours are, let us transmit through the blue glass the prismatic spectrum R I, as illustrated in the annexed figure—in which

A represents violet, B indigo, C blue, D green, E yellow, F orange, and G red.



PRISMATIC COLOURS.

Or, what is the same thing, let the observer place his eye behind the prism B A C, and look through it at the sun, or rather at a circular aperture made in the window shutter of a dark room. He will then see through the prism the spectrum K L as far below the aperture as it was above the spot P, when shown on the screen. Let the blue glass be now interposed between the eye and the prism, and a remarkable spectrum will be seen, deficient in a certain number of its differently-coloured rays. A particular thickness *absorbs* the middle of the red space, the whole of the orange, a great part of the green, a considerable part of the blue, a little of the indigo, and very little of the violet. The yellow space, which has not been much absorbed, has increased in breadth. It occupies part of the space formerly occupied by the *orange* on the one side, and part of the space formerly covered by the *green* on the other. Hence it follows, that the blue glass has absorbed the red light, which, when mixed with the *yellow*, constituted the part of the green space next to the *yellow*. We have, therefore, by absorption, decomposed *green* light into *yellow* and *blue*, and *orange* light into *yellow* and *red;* and it consequently follows, that the orange and green rays of the spectrum, though they cannot be decomposed by prismatic refraction, can be decomposed by *absorption*, and actually consist of two different colours possessing the same degree of refrangibility.'

ACA'CIANS, an appellation given to various sects of religionists in the primitive ages of Christianity. Two of them originated from Acacius, bishop of Cæsarea, in the fourth century.

ACADEM'ICS (so called from the Academy at Athens, where the followers of Plato were in the habit of assembling) was a name applied to those philosophers who adhered to the doctrines of Socrates and Plato regarding the uncertainty of knowledge and incomprehensibility of truth. Their original maxim was, 'I am certain of nothing; no, not even that I know nothing.' They therefore insisted that the mind ought always to remain in suspense. Thus, whatever might be the sceptical notions of some philosophers, Academics only doubted, in order that their determination might afterwards be the more certain.

ACADEMIES (i. 94). Italy was long celebrated for its academies, and amongst the most renowned were those of Florence, Genoa, Bologna, Mantua, Milan, Naples, Padua, Turin, Verona, and Rome. They have since spread over Europe, and in each state some very superior establishments of the kind might be mentioned.

ACAD'EMY, The ROYAL MILITARY, an establishment at Woolwich, intended for the education of young gentlemen who are admitted as cadets, and who, on the completion of their studies, are regularly commissioned, either in the artillery or the engineers' service. It was instituted about the year 1709; but not finally organised till 1741. It is built in the castellated form, and consists, in front, of a centre and two wings, united by corridors, with a range of building behind, containing the hall, servants' offices, &c. The whole edifice is embattled, and about 200 yards in length.

ACÆ'NA (Gr. *ἄκαινα* a thorn), a genus of exotic perennial plants, of the order Sanguisorbacea.

ACÆ'NIDUS, a genus of insects of the tribe Ichneumonides.

ACAN'THÆ (Gr. *ἄκανθα* a thorn), a general name for the prickles of thorny plants, or the spines of fishes.

ACAN'THIZA, a genus of birds of the family Sylviadeæ, belonging to the Sylvianæ or Warblers.

ACANTHOB'OLE (Gr. *ἄκανθα* a thorn, and *βάλλω* to strike), in surgical operations an instrument used for the extraction of splinters of bone, or of any foreign body, from a wound.

ACANTHOCEPH'ALA (Gr. *ἄκανθα* a spine, and *κεφαλὴ* a head), a family of intestinal worms belonging to the class *Entozoa*, which attach themselves to the animal intestines by means of a prominence armed with recurved spines.

ACANTHOME'RA (Gr. *ἄκανθα*, and *μηρὸς* the thigh), a genus of coleopterous insects, of the family Melasoma; also a genus of dipterous insects, of the family Notacantha.

ACANTHONO'TUS (Gr. *spine-backed*), a genus of fishes furnished with dorsal and anal spines.

ACAN'THOPOD (Gr. *prickle-legged*), a tribe of clavicorn and coleopterous insects; also a genus of fishes, with the ventral fins represented by two sharp spines: fam. Squamipennes.

ACANTHOP'TERA (Gr. *prickle-winged*), a genus of coleopterous insects; fam. Cerambycidæ.

ACAN'ZI, in the military history of Turkey a kind of light horse, which formed the vanguard of the Sultan's army.

ACAR'DIA (Gr. *without a hinge*), a genus of fossil bivalve shells of the oyster kind.

ACAR'DO (Gr. ut supra), a genus of flat bivalve shells.

ACAR'NAR (Arab.), the name of a brilliant star of the first magnitude in the constellation Eridanus.

ACAS'TA (Gr. *sharpness*), in conchology a genus of cirripeds, with subconic compressed shells.

ACATHAR'SIA (Gr. *uncleanness*), in medi-

cine, impurity of the blood; and in surgery the gordes proceeding from a wound.

ACAU'LOUS (Gr. *wanting the stalk*), in botany, those plants which are without the stem or *caulis*, and have their flower resting on the ground.

ACCEN'DONES, among the Romans a kind of gladiators or supernumeraries, whose duty it was to excite and animate the combatants during their contests.

ACCEN'TOR (Lat. *a musical harmonist*), a genus of birds belonging to the Parinæ or Titmice; fam. Silviadæ. In Music, one who takes the lead of a band or chorus.

ACCIATU'RA (Ital.), a term in music to express the manner in which particular passages are to be executed.

ACCORDATU'RA (Ital. *accordance*), in music a particular mode of tuning a stringed instrument.

ACCRESCIMEN'TO (Ital. *increasing*), in music, the increase of a note by one-half of its original duration, which is indicated by a dot on its right.

ACEL'DAMA, the field which the Jewish priests bought with the thirty pieces of silver given to Judas Iscariot for betraying Christ. It received the name as being the inheritance or portion of blood. After Judas had thrown away the money, and hanged himself, the priests, not considering it lawful to deposit it in the treasury of the Temple, bought a field with it, called the *Potter's*, for the burial of strangers. We are told that this field, being small, is now covered over with an arched roof, and still shown to strangers. (Nuttall's *Archæol. Dict.*)

ACEPH'ALA, or ACEPH'ALES (Gr. α and κεφαλή, without a head), a term applied to a headless class of mollusca, as the oyster and the mussel. They comprehend two great divisions, the *testaceous acephala*, and the *naked acephala*. The former are by far the most numerous; all the bivalves and some of the multivalves belonging to them. Their shells consist of two valves, connected by a hinge; and a considerable number of the bivalves possess what is called a *byssus;* that is, a bundle of delicate filaments issuing from the base of the foot, and by means of which the animal attaches itself to foreign bodies. In the greater number the valves close perfectly when the animal wishes to draw them together; but there are some which always gape, even when brought as nigh together as possible. This class of Testacea is divided into five distinct families—the Ostrea, the Myrtilaceæ, the Camacea, the Cardiacea, and the Inclusa.

ACEPH'ALI (Gr. *wanting a head*), a name given to several religious sects in the early ages of Christianity, because they refused to acknowledge some distinguished leader. Those, for instance, who followed neither St. Cyril nor John of Antioch, in a dispute that existed in the council of Ephesus, were designated *Acephali*. The term was also applied to a body of levellers in the reign of Henry I., because they acknowledged no head or superior. They were so poor, says Du Cange, that they had not a tenement by which to acknowledge a superior lord.

ACETAB'ULUM (Lat. *a vinegar cruet*), in anatomy, the cuplike cavity in a bone, which receives the end of another bone, as the hip-bone. In botany, a kind of lichen; the sea navel-wort.

ACHATI'NA (Gr. *the agate*), a genus of snails, with oblong striated shells: fam. Helicidæ.

ACHILLIS TENDO (Lat. *the tendon of Achilles*), in anatomy, a tendinous ligament inserted in the *os calcis*, or heel.

ACHLAMYD'EÆ (Gr. *without a tunic*), the term applied to those naked plants which have neither corolla nor calyx.

ACHYRAN'THES (Gr. *chaff-flowered*), a genus of evergreen undershrubs, of the natural order Amarantaceæ.

ACIC'ULÆ (Lat. *little needles*), in botany and zoology, the spikes, prickles, or spines on certain plants and animals, of which the Cacti and Echini afford striking specimens.

ACIDIFIABLE BASE, is a term of general use in chemistry to denote any simple or compound that can unite, without decomposition, with oxygen, so as to possess acid properties. Though nearly all acids contain oxygen, yet they differ in their bases, so that the acidifiable base determines the kind of acid.

ACIDIM'ETER (Lat. *acidum* an acid, and Gr. μετρὸν a measure), an instrument for ascertaining the strength of the various acids, as enumerated under the general head of ACIDS.

ACIDS (i. 121-2). According to Dr. Thompson's chemical arrangement, the compounds which simple bodies form are either primary or secondary. By primary compounds is generally understood those which are formed by the combination of two or more simple bodies with each other; while, by secondary compounds are implied such as are formed by the union of the primary compounds, which are divided into Acids, Alkalies (or bases), and Neutrals. The term acid, as employed by chemists, is intended to denote a substance which has the property of combining with and neutralising alkalies or bases. The celebrated French chemist, Lavoisier, attempted to demonstrate that oxygen constitutes an essential ingredient of all the acids; but more recent inquirers have shown that not only oxygen, but chlorine, bromine, iodine, and fluorine, as being analogous principles, are capable of forming acids, by uniting with several of the acidifiable bases. [BASES, *Suppl.*] More recently it has been shown that certain primary compounds, as of sulphur, cyanogen, selenium, and tellurium, with the acidifiable bases, have been ranked among the acids. Thus the acids at present known may be divided into nine distinct classes—oxygen, chlorine, bromine, iodine, fluorine, cyanogen, sulphur, selenium, and tellurium acids.

The *Oxygen* acids are by far the most numerous and important; those with a single basis amounting to upwards of thirty; such as carbonic acid, sulphuric, phosphoric, nitric, &c. Those with a compound base are still more numerous,—the number at present known amounting to upwards of sixty. They are chiefly derived from the vegetable or animal kingdoms; as the tartaric acid, the citric, the lithic, the malic, and so on.

The *Chlorine, Bromine, Iodine,* and *Fluorine* acids, are not so satisfactorily understood as the preceding; but the acid most familiarly known, as belonging to the first class, is muriatic or hydrochloric acid, which is compounded of chlorine and hydrogen; and the acids formed with hydrogen, from the three classes (bromine, iodine, and fluorine) are the hydrobromic, the hydriodic, and the hydrofluoric acids, which are known to possess the most decided properties.

The *Cyanogen* acids are numerous, and most of them poisonous. Thus, when compounded with hydrogen, they produce hydrocyanic or prussic acid, which is a deadly poison.

Of the *Sulphur, Selenium,* and *Tellurium* acids, but little is known. They were formerly known under the name of sulphuretted, seleniuretted, and telluretted hydrogen; but some chemists have given a different nomenclature to them.

The following is an alphabetical enumeration of the principal acids now known; the nature and properties of which are more fully explained under their respective heads.

Acetic, which constitutes vinegar and pyroligneous acid.

Amniotic, which is obtained from the liquor of the amnios of the cow.

Arsenious, a compound of arsenic with oxygen, or white oxide of arsenic.

Benzoic, a peculiar substance existing in many aromatic resins, such as balsam of Peru, &c.

Boracic, a peculiar acid derived from a substance called *borax;* which forms, in combination, the varieties of salts called *borates.*

Camphoric, prepared from camphor by means of nitric acid.

Carbonic, a compound of carbon and oxygen, a species of mephitic gas, which the miners called choke-damp.

Chromic acid, or the peroxide of chrome, a substance found in Siberia, and which is procured by the decomposition of native chromate of lead.

Citric, an acid obtained in crystals from the juice of lemons.

Cyanic, which is formed of 26 equiv. of cyanogen + 8 of oxygen = 34.

Fluoric, obtained in the form of gas, by putting a quantity of fluor-spar into a heated retort, and pouring over it an equal quantity of sulphuric acid. It has the peculiar property of dissolving glass.

Gallic, an acid obtained in fine white needles from macerated gall-nuts.

Hydrofluoric, a compound of hydrogen with fluorine, which has the singular property, when passed through water, of converting that with which it comes in contact into a species of stone.

Lacric acid is procured from a substance called *white lac.*

Lactic is an acid of a yellow colour, prepared by a peculiar process from milk, after the curd has been separated.

Lithic acid (see *Uric* acid).

Malic acid is obtained from the juice of apples, strawberries, and other summer fruits, in which it may be said to exist already formed.

Molybdic acid is a pale yellow powder, composed of molybdenum and oxygen.

Mucous, or *saccholactic,* is obtained by nitric acid from gum arabic and other mucilaginous substances, in the form of a white gritty powder.

Muriatic, an acid obtained from common salt by distilling it in retorts, with a certain portion of sulphuric acid.

Nitric acid is composed of nitrogen and oxygen, and is a very powerful solvent of both vegetable and mineral bodies.

Nitro-Muriatic, a mixture of the nitric and muriatic acids, which thus combined has the power of dissolving gold; it is the *aqua regia* of the alchemists of old.

Oxalic, a poisonous acid, obtained from sugar, sometimes called *acid of sugar;* it is also obtained from fruits, and is found in considerable quantities in wood sorrel, the *oxalis acetosella.*

Oxymuriatic acid, an old name for those compounds called *chlorine.*

Prussic, now called *cyanic,* is a poisonous acid, extracted from the kernels of various stone fruits, and from the leaves of the laurel.

Pyrolignous, an acid produced or generated by the combustion of wood, which is an impure vinegar.

Sebacic acid is obtained from tallow or animal fat, and when mixed with nitric acid will dissolve gold.

Suberic is produced from cork, by means of nitric acid.

Succinic is an acid prepared from amber, which is useful as a re-agent.

Sulphuric acid is the produce of sulphur burnt with nitre, or a compound of sulphur and oxygen, commonly called *oil of vitriol.*

Sulphurous acid is colourless and gaseous, and of a pungent and suffocating odour, being that which is emitted by burning sulphur.

Tartaric acid, or *acid of tartar,* is obtained from grape juice, tamarinds, and various other fruits.

Tungstic, or *peroxide of tungsten,* is obtained from two native combinations, *wolfram,* which is generally found in the tin ores of Cornwall, and *tungstate of lime.*

Uric, or *lithic,* is an acid found in human urine, and is a composition of carbon, nitrogen, hydrogen, and oxygen.

Testing of Acids. The presence of *arsenic,* one of the most deadly poisons in nature, may in general, when contained in any mineral, be detected by the blow-pipe, owing to the peculiar odour of the vapour of metallic arsenic. The presence, also, of any particular acids may be readily detected by the heated action of the blow-pipe; for instance, *muriatic acid* may be discovered on fusing oxide of copper with salt of phosphorus into a dark green globule, and adding the assay. If this acid be present, the globule, during the application of heat, is surrounded by a fine blue flame approaching to purple. The *nitrates,* when infusible, must be heated to redness in a tube closed at one end. Nitrous gas is then given off, and meeting the oxygen of the atmosphere is converted into nitrous acid gas, which is exhibited as an orange-coloured vapour. *Phosphoric acid* is detected by fusing the assay with boracic acid. If

the assay contains phosphoric acid, the iron is oxidated at the expense of the acid, and a borate of protoxide and phosphuret of iron is the result. *Sulphuric* acid is detected by fusing silica and soda into a globule, and then, having placed the assay upon the globule, heating them together in the flame of the blow-pipe. In this operation the sulphuric acid is reduced, and the sulphuret of soda is formed.

ACOL'YTHIST, or AC'OLYTE, in ecclesiastical antiquity, a church officer superior to the sub-deacon. The term is derived from the Acolythi, a name applied to the Stoics and others among the ancients, from the sternness of their moral principles—the meaning of the word being, not to turn out of the way.

ACONI'TAS, a name given by Cuvier to a genus of serpents remarkable for the velocity with which they dart upon their assailants; hence they have been called Jacula, or dart-snakes. They are usually very small, and harmless in their habits.

ACOTYLE'DONS (i. 125). This grand division of the vegetable kingdom, which comprehends plants without seed-lobes, has received the modern appellation of *Cellulares*, or plants which are composed of cellular tissue only. The lowest tribes, the Fungi and Algæ, are entirely without leaves; while the highest tribe, the Ferns, approach in character to the Vasculares, and hold an intermediate position between these and the Cellulares. The Acotyledons, or Cellulares, are divided into two families, the *Foliaceæ* and the *Aphyllæ*. The former comprehends the Filices or Ferns, Equisitaceæ, Lycopodineæ, Marsiliaceæ, Musci, and the Hypaticeæ. The family of the Aphyllæ comprehends the cryptogamous classes of Linnæus, the Algæ, the Lichenes, and the Fungi.

ACOUSTIC TUBES (i. 126-131). Since the discovery of the various uses to which gutta-percha may be applied in the arts, the science of Acoustics has been greatly aided by the use of this material in the conveyance of vocal sounds, and the transmission of messages from one part of a building to another. The services which speaking tubes of gutta-percha have thus rendered in business and domestic communications are most extraordinary. The ductility of the material, its peculiar elasticity, and the smoothness of its surface-texture, all combine to render it one of the most useful agents in nature for the conveyance of articulate sounds.

In a speaking or acoustic tube there are two essential requisites: first, that it shall concentrate a large amount of sound in a small space; and secondly, that the acoustic vibrations shall not be stifled in passing through the tube. For the first object it simply requires a trumpet-shaped mouth at one end, and a small orifice at the other; and for the second purpose, gutta-percha appears to possess extraordinary qualities in the preservation of clear and sonorous vibrations. In many cases the gutta-percha tube is formed with a small trumpet-shaped orifice at each end, and two common whistles are attached. In communicating with any person at the other end of the tube, the whistle is sounded, and a corresponding whistle is given at the other end, for the purpose of intimating that you are desirous of conveying some message, or holding a conversation. The whistles are then taken off, and the intercommunication takes place in the clearest tones, without any chance of misapprehension. The same process can be carried on with equal success at either end of the tube, at whatever distance the parties may be. Of such advantage have these acoustic tubes been found, that in manufactories, printing-offices, weaving-mills, hospitals, union poor-houses, and other large establishments, they have been generally adopted, and the communications between distant rooms and out-buildings are found complete.

For the different uses to which this material has been applied in the arts the reader is referred to the article GUTTA-PERCHA; but for an enumeration of the various modes in which acoustic operations are carried into effect by its agency, we shall select a few details from a very useful little work, entitled, 'Novelties, Inventions, and Curiosities in Arts and Manufactures.'

'There is, for example, the *long-eared trumpet*, with a wide orifice at one end, and a small one at the other; and there is the *portable ear-trumpet*, differing from the former only in bringing the speaker and the hearer close together, by a French-horn system of twisting in the tube. There is the *ear-cornet*, so small and neat that one may be almost invisibly attached to or near each ear. There is the *paraboloid trumpet*, in which the sound is echoed from a large concave receiver before it enters the tube. There is the trumpet with a long flexible tube, or with several tubes, so that several persons round a table can communicate in turn with the user.'

The writer then proceeds to notice the important domestic uses to which gutta-percha may be acoustically applied, a short sketch of which we have already given. 'The Domestic Telegraph,' says the writer, 'is simply a gutta-percha tube constructed from one apartment to another; it is employed as a medium of transmitting messages, and saves many a weary footstep to those who are at the beck and call of others. The *Medical Man's Midnight Friend* is a gutta-percha tube extending from the doctor's street-door to his bed, by which a message can be transmitted to the awakened practitioner, instead of merely the sound of his bell.' After thus enumerating different modes to which acoustic apparatus may be applied, the writer proceeds to describe its application to church purposes: 'Let us conceive (says he) that in a remote pew of this church is a person who, though not deaf, yet fails in ability to hear what is said in the pulpit or reading-desk. A gutta-percha tube is laid down either on or beneath the floor from the pulpit to the pew—the material bends so easily that it may be carried in any form—and a small ivory or hard wood ear-piece is attached to one end, while the other end expands in trumpet form. Now the remarkable circumstance is, that the required effect is brought about without necessitating the approach of the speaker's mouth to the tube; his head may be two or three feet above, or below, or behind, or at the side of the

trumpet mouth; and yet the sound will reach the remote end of the tube in audible quantity.' Again, 'In practice the trumpet mouth is fixed to the front of the pulpit, mouth uppermost, and is stamped or moulded in an ornamental form consistent with the decorations of the pulpit. Beyond all this, the sound may be *laid on*, like gas, to any pew or any quarter of the church; for there may be a tube (which we will call the main-pipe) laid along the centre aisle, and lateral tubes may spring from this to any required spot. Some clergymen have what they call a *deaf pew;* that is, a pew in which those are congregated who may be collectively benefited by this admirable apparatus.' The writer then concludes by informing us that a contrivance somewhat similar to the above has been used at some of the great meetings at Exeter Hall, by those to whom the speeches would otherwise have been utterly inaudible.

ACRID'IUM, or ACRYD'IUM (Gr. ἄκρις a locust), a genus of insects of the locust family, having the wings and elytra sloping like a roof; their legs are constructed for leaping; their antennæ filiform; the tarsi with three joints, and a spongy ball between the hooks.

AC'ROGENS (Gr. ἄκρος extreme, and γεννάω to produce), in botany a term generally applied to cellular plants, to distinguish them by their manner of growth, which increases principally in length, not in thickness. Thus Exogens increase externally in thickness, while Endogens increase internally. For the other characteristics of this division of the vegetable kingdom, see ACOTYLEDONS.

ACROL'ITHI, a name applied to those statues among the classical ancients which had the head, hands, and feet, of marble, and the rest of wood, or other materials. Such statues are still in existence. Two small figures of this description were found at Pompeii.

ACROPO'DIUM (Gr. ἄκρος on the summit, and πόδις feet), a genus of leguminous shrubs, natives of the Cape of Good Hope, belonging to the sub-order *Papilionaceæ*. In zoology it denotes the upper surface of the foot, and is particularly applied to the feet of birds.

ACROSPO'RIUM (Gr. ἄκρος extreme, and σπωρία a sporule), a genus of Fungi, occurring in red-coloured patches on rotten oranges and the leaves of grasses.

ACTIAN GAMES, were instituted by Augustus in commemoration of his victory over Marc Anthony at Actium. They consisted of gladiatorial shows and other manly exercises. They were sometimes called *Ludi Quinquennales*, from the periods of their celebration.

ACTINISM (Gr. ἀκτὶν a ray), in physics, the radiation of light or heat. The term is therefore applied to that branch of natural philosophy which treats of the radiation of heat or light.

ACTRESSES. The appearance of women in the drama is altogether a modern custom. It was not done in ancient countries, nor amongst us, before the reign of Charles II. Mrs. Mary Saunderson performed Ianthe in Davenant's play of the 'Siege of Rhodes' at the first opening of Betterton's theatre in April, 1662. This lady was afterwards married to the celebrated Betterton, and she died in 1712. She was the first actress of any celebrity on the English stage. Amongst actresses that have been ennobled, may be mentioned Miss Elizabeth Farren, who on the 8th of May, 1797, was married to the Earl of Derby. Miss Farren first appeared at Liverpool in 1773, as Rosetta, in 'Love in a Village.' In 1777 she performed at the Haymarket in Goldsmith's comedy of 'She Stoops to Conquer,' and she afterwards appeared both in comedy and tragedy at Drury Lane and Covent Garden. Charles Fox became her slave, and spent many hours behind the scenes in her company. On the death of his first Countess the Earl of Derby made Miss Farren his wife. Just before this, Miss Farren took her leave of the public in the character of Lady Teazle in the 'School for Scandal.' She shone in the sphere of fashionable life, as she had before done on the stage, and was a woman of most exemplary character. She had three children, only one of whom survived her, the amiable and accomplished Countess of Wilton. The Countess of Derby died on the 23rd of April, 1829. The late Duchess of St. Albans, Miss Mellon, first made her début at Drury Lane in Jan. 1795, as Lydia Languish, in the 'Rivals,' and in 1814 she became the wife of Mr. Coutts, the wealthy banker. In June, 1827, she was married to William, Duke of St. Albans. She died in 1837, universally respected. The late Earl of Essex married Miss Stephens, the celebrated vocalist, on the 19th of April, 1838. This peer died the year after the marriage. Miss Brunton and Miss Foote, who ranked amongst the most popular actresses of their day, were both raised, by their marriages, to the dignity of peeresses.

ACTUARY (i. 148). From the *Staats-Lexicon* we learn that an actuary in Germany is an officer of much higher importance than in England. He is usually attached to some judicial functionary, and is duly qualified and sworn to take notes of all official proceedings. His duty is also to collect and keep the records of official acts, and to draw up protocols and registrations. Actuaries have various names, according to the offices or particular functionaries to which they may be attached. In the ecclesiastical courts they are termed *prothonotaries;* and in the higher provincial colleges, *secretaries*. When they are attached to the great public functionaries they are called *official actuaries* or *clerks* (*Amtschreiber*). There are actuaries subordinate to the principal one, who are designated judicial notaries, or registrars, and they hold an important position in public proceedings. Every actuary, before being appointed to his important office, must have undergone a rigid examination as to his capabilities and general qualifications. In fact, in all judicial proceedings the actuary and the judge are a mutual check on each other; and hence the former is responsible for the accuracy and completeness of all his notes, acts, and proceedings.

ACU'LEATES (Lat. *aculeus* a prickle or sting), a tribe of Hymenopterous insects, in which the females and neuters are provided with a sting concealed in the hinder segment of the abdomen

In ichthyology fishes are divided into those which have aculeated and not aculeated fins.

ADAIR, RT. HON. SIR ROBERT, G.C.B., the veteran diplomatist and statesman, was born in 1763; and one of his earliest reminiscences was connected with the 'Wilkes and liberty riots,' when, at the age of six, he signalized his hatred of despotic principles by joining the mob and breaking his own father's windows. He was educated at Westminster School, and completed his course of scholastic studies at the university of Gottingen. On his return to England, in 1790, Mr. Adair made the acquaintance of his kinsman Charles James Fox. After the breaking out of the French revolution he visited Berlin, Vienna, and Petersburgh, with a view to his future calling of diplomatist, and made a long sojourn at the latter place.

At the general election of 1802, Mr. Adair was returned to parliament for Appleby, and in 1806 for Camelford. In April of the same year, Mr. Fox appointed him minister to the court of Vienna; and the account of his mission was afterwards published by him, in his 82nd year. Although Mr. Canning had frequently ridiculed this appointment, when he became foreign minister he selected Mr. Adair from the ranks of the opposition as the fittest person to conduct our diplomatic relations with the Ottoman court. This mission terminated in the peace of the Dardanelles in 1809, an account of which has been furnished by Sir R. Adair himself. He was then nominated a knight of the Bath; and during the same year was appointed ambassador at Constantinople, which post he held till 1811.

For the next twenty years Sir Robert was excluded from any diplomatic appointment, owing to the circumstance of his party being so long out of office; but in 1831 he was sent by Earl Grey to Belgium on a mission of no ordinary difficulty. Prince Leopold had just been placed on the throne of that newly-formed kingdom; and was actually besieged by the Prince of Orange. A general battle was daily expected, which might have involved Europe in the flames of war. But the diplomatic skill and prudence of Sir Robert succeeded in averting the calamity, and he eventually conciliated the belligerent parties. He continued to hold this appointment till 1835; when he was raised to the dignity of a privy councillor, and for his important services received the highest diplomatic pension of £2000 per annum.

Independently of the memoirs just mentioned, Sir Robert was the author of several political pamphlets, in which he relates many curious anecdotes of the past, and discusses many points regarding the present, with great energy and perspicuity. He died in October, 1855.

ADAMANTINE SPAR, a mineral distinguished from every other by its great hardness; which is such, that it is used for polishing even the diamond. Like the sapphire and ruby it occurs in the secondary six-sided prisms, sometimes in acute or obtuse double six-sided prisms. In colour it is rather translucent, and sometimes nearly colourless. Its specific gravity is from 3·9 to 4·01. It consists of alumina, 91·00; silica, 5·00; oxide of iron, 1·5 = 97·5. It is often known by the Indian name of corundum, of which there are four distinct species,—the dodecahedral, the octahedral, the rhombohedral (as the ruby and sapphire), and the prismatic (as the chrysoberyl).

AD'AMITES, a sect of fanatics, existing in the early periods of Christianity, who pretended to imitate Adam's nakedness before the fall. Believing themselves in a state of innocence and purity, since their redemption by the death of Christ, they met together naked upon all occasions, and maintained that if Adam had not sinned there would have been no marriages. In the 13th century this sect was renewed at Antwerp by one Tanchelm, who, being followed by 3000 soldiers, committed the most outrageous excesses, to which they applied spiritual names. In the 15th century the sect was revived in Bohemia by one Picard, a Flandrian, and afterwards spread into Poland.—(Bayle's *Hist. Dict.*)

ADAMS, JOHN QUINCY, a distinguished American statesman, son of the President John Adams, and sixth President of the United States, who, from the exalted position of his father, possessed all the advantages of education and connections, of which he did not fail successfully to avail himself. He was born at Quincy, on the 11th of July, 1767; and before the year 1780 he went abroad with his father. He appears to have undergone a regular course of legal study under Theophilus Parsons, at Newburyport, and first attracted attention by certain essays which he published in the newspapers of the day. In 1794 he entered upon the political arena of life. Washington then appointed him minister to the Netherlands, and afterwards to Portugal. On his father becoming President he was transferred, in his diplomatic capacity, to Berlin. In 1802 he was elected to the senate of Massachusetts, and, in 1803, to the senate of the United States. In 1806 he was appointed professor of rhetoric in Harvard, and delivered a course of lectures on 'The Art of Speaking Well,' which were afterwards published in a book form. In 1809, when Mr. Madison was President, he was appointed minister to Russia. He was afterwards employed as one of the commissioners, who, in 1814, negotiated the peace at Ghent, between England and the United States. In 1815 he was sent by Madison as minister plenipotentiary to Great Britain; and in 1817 President Monroe appointed him Secretary of State. In 1825 he arrived at the climax of political honours, by being chosen President of the United States; and in that exalted position he faithfully discharged all its duties. In 1829 he retired to private life; but in 1831 he was chosen a representative to Congress, where he remained till 1848, when his life was suddenly terminated by an attack of apoplexy. His dying words were, 'This is the last of earth.' He was considered a man of independent and incorruptible principles; and, at the same time, he was endowed with all the leading characteristics of an orator and a statesman.

ADAMS, MAJOR-GENERAL SIR J. W., a distinguished officer of the East India Company's service, who entered the army in 1780,

and was engaged in most of the great battles and sieges of the Indian peninsula, from that period to the time of his death. He was at the storming of Seringapatam in 1799; and was actively engaged in the Marattah war in 1817–18. In 1826 he was at the storming of Bhurtpoor; and, as brigadier-general, was appointed to the command of the reserve, with which he entered the fort, and took possession of the citadel. In 1830 he was promoted to the rank of major-general, and subsequently made a *knight* commander of the Bath. He died on the 8th of March, 1837, aged 74.

ADDISCOMBE SEMINARY, an important collegiate institution, situated near Croydon, in Surrey, for the education of young gentlemen intended for the military service of the East India Company. It was formerly the residence of the Earl of Liverpool, and known as Addiscombe House, but purchased in 1809 by the East India Company, and opened in 1825 for the reception of cadets for the whole of their military service, with the exception of the cavalry. The number of students is generally about 150; and the institution is under the inspection of officers of distinction, belonging to the corps of engineers and artillery, to whom is entrusted the examination of the cadets. There are 17 professors and masters employed in the several departments of the institution. Under the auspices and direction of the company, this institution has obtained a rank equal to that of any military establishment of the kingdom. The conditions and qualifications for admission to the college are, that no candidate can be admitted under the age of 14, or above that of 18 years; that every candidate must produce certificates of his birth, and of good conduct from the master under whom he has last studied; and that he is well acquainted with the usual rudiments of a liberal education.

ADELAIDE, a city of South Australia (xi. 227). Since the brief incidental notice which appears under our general account of South Australia, this settlement has been gradually rising into importance; and the late successful navigation of the river Murray, to the extent of 1700 miles from its mouth, is likely to contribute still further to its growing prosperity. The city of Adelaide is in lat. 34° 57′ S., and lon. 138° 38′ W., and situated about seven miles S.E. from its port, and on the east side of the gulf of St. Vincent. It is divided into two portions by the river Torrens, both of which stand on gentle elevations, which are regularly laid out in streets of from 70 to 130 feet in width, and cross each other at right angles. Already do several handsome squares and splendid public edifices adorn this capital of Southern Australia. Among the principal buildings are the government houses, Trinity and St. John's churches, the legislative council house, the court houses, the office of the S. Australia bank, an auction mart, the offices of the S. Australian Company, and an immense gaol, upon which nearly 40,000*l.* has been expended. Numerous edifices have also been erected for the various religious denominations—Roman Catholics, Presbyterians, Baptists, Independents, Methodists, German Lutherans, Quakers, Jews, and others. There are also numerous schools, the South Australian bank and its branches, a South Australian Assurance Company, a philanthropic institution, a mechanics' institute, a botanic garden, a public cemetery, &c. The manufactures, trade, and literature of the city appear to be in keeping with the progressive adornment of the town. There are manufactories of woollen goods, starch, soap, snuff, brass, iron, leather, and different kinds of machinery. It has also a variety of steam and other mills; with breweries, malt-houses, tanneries, &c. Its trade in ores, wool, earthenware, and every species of agricultural produce, is very extensive. Around the city, on the east and south, is a semicircle of hills, some rising to upwards of 2000 feet above the sea; and within three or four miles are some of the principal lead mines in the colony. Some copper mines are but a few miles farther distant. Several newspapers have been established within the last few years; and general literature is beginning to receive encouragement.

The city of Adelaide having been founded by Colonel Light, the inhabitants have recently erected to his memory, in Light Square, a handsome Gothic cross, 45 feet high. In 1845 Adelaide was made a free port to the vessels of all nations. In 1849 the imports were valued at 471,556*l.*, and the exports at 485,951*l.* 112,338 tons of shipping entered outwards and inwards; 16,000 tons of copper ore and 19,000 cwt. of wool were exported. A railway from Adelaide to Port Adelaide was undertaken in 1850, which promises immense advantages. The population of the city, in 1850, was 10,000; and that of the adjoining port 2500; and since that period it has been rapidly increasing. Notwithstanding the temporary check given to the mining prosperity of the district, by the discovery of the gold-fields in Victoria and New South Wales, the total exports of native produce from the colony amounted, in 1852, to 914,738*l.*, and those of copper and copper ores to 374,778*l.* The amount of crude gold delivered at the assay office, during the year 1852, amounted to 1,448,761*l.*

ADEPTS, a term frequently used by our early writers, and applied to those alchemists who were supposed to have discovered the philosopher's stone.

ADIAPH'ORITES (Gr. *ἀδιάφορες indifferent*), a name given in the 16th century to certain persons that followed Melancthon, who was more pacific than Luther. They were looked upon as moderate Lutherans; and received their appellation from the *indifference* with which they regarded some of the opinions and ceremonies condemned by Luther as heretical and sinful.

ADMIXTURE OF METALS. (See METALS). This subject is very clearly illustrated in a small work entitled 'Novelties, Inventions, and Curiosities in Arts and Manufactures.' The author says: 'One of the improvements introduced in recent years in metallurgy is a combination of many kinds of iron, to insure the good qualities of each; and another is the admixture of small quantities of other metals. It is supposed that the fluidity

of Berlin cast-iron, by which the exquisitely-delicate ornaments are capable of being produced, is due to the addition of a little arsenic. Manganese is found to give a closeness of grain to iron. Calamine (carbonate of zinc) gives increased malleability to iron; and with certain kinds it produces extraordinary toughness. If calamine be introduced into the iron of a wheel or a rail, it gives toughness and strength; while if antimony be added to the iron of the surface, it imparts a steely hardness; so that qualities can be induced suitable to the different kinds of service which each part is to render. And it is remarkable that these changes are wrought by so small a ratio as 1 per cent. or less of the additional metal. On the other hand, the addition of 1 or 2 per cent. of iron to brass has recently been found to produce a most valuable substitute for bell-metal, gun-metal, and similar compounds; large guns, large screws, propeller vanes, mill brasses, railway bearings, bells, and other articles, are now made of a metal in which copper, zinc, tin, and iron all take part; the proportions are varied, according as toughness, hardness, sonorous power, or susceptibility of receiving a polish, are required; but the combined cheapness and efficiency of the new alloys are now becoming very apparent. Russian sheet iron is said to be superior in quality to most produced in England; a peculiar fibrous iron is required; and this fibrous quality is given to the Russian iron (as is supposed) by the presence of a little phosphorus and a little silica in the ore, and by the acquisition of a little carbon from the wood-fuel used in smelting. Such are the discoveries which chemistry is gradually enabling us to make; when we know the causes of difference, we may, perchance, make those differences disappear at pleasure.'

ADOLPHUS, JOHN, a barrister of considerable practice, who was the author of various works of standard repute. He wrote, among other things, a History of George III., a History of England, History of the French Revolution, and a Memoir of John Bannister, the comedian. He died in 1845.

ADONISTS (Heb. *Adon* Lord). Among the Jews the Adonists are a party or sect who are at issue with their brethren as to the legitimate pronunciation of the sacred word Jehovah,—a name which, among the Jews, it is irreverential lightly to utter; and therefore it is pronounced by this sect as Adonai. The question on which they are at issue with the majority of their brethren is relative to the true pronunciation of the Masoretic points, annexed to the sacred word, which, they contend, are the vowel points belonging to the word Adonai or Elohim. (Craig's *Etymol. Dict.*)

ADRIATIC, WEDDING THE (i. 188). The Doge of Venice performed this ceremony every year on Ascension day. With much pomp and ceremony he proceeded in a state barge (the Bucentaur), attended by the nobility and foreign ambassadors, and dropped his ring into the water. This strange ceremony, typical of the supremacy of Venice, was instituted in 1177. Sir Gardiner Wilkinson thus describes its origin:—'It was between Piráno and Parenzo, on the coast of Istria, that Ziani, in 1177, defeated the combined fleet of Pisa, Genoa, and Ancona, under the command of Otho, the son of the Emperor Frederic Barbarossa, who was made prisoner, and carried to Venice; and this victory is remarkable for having given rise to the ceremony performed by the Doges of wedding the Adriatic. For when the victorious fleet returned to the Lido, Pope Alexander III., then a fugitive at Venice, gave his ring to Ziani, authorising him and his successors annually to proclaim their right to the sovereignty of the Adriatic, and subject it to the rule of Venice, as a wife to that of her husband.'

ADULTERATION (i. 189). The act 6 & 7 Wm. IV., c. 37, repeals the various acts previously in force for regulating the sale of bread sold beyond the city and liberties of London and ten miles of the Royal Exchange; and at the same time it enacts severe penalties against the adulteration of meal, flour, and bread, beyond those limits. According to the second section of this act the ingredients allowed to be used in making bread for sale are to consist of meal or flour of wheat, barley, oats, rye, buckwheat, Indian corn, peas, beans, rice, or potatoes; which are to be mixed with pure water, and common salt, eggs, milk, barm, leaven, potato or other yeast; and these in such proportions as the bakers think proper. The act then proceeds to state (sect. 8) that the mixture of other ingredients than those above mentioned is punishable by a fine of not less than 5*l.*, nor to exceed 10*l.*, or imprisonment for any period not exceeding six months; and the name of the offender is to be published in a local newspaper. In the 9th section it is enacted that the adulteration of corn, meal, or flour, or the selling of flour of one sort of corn as flour of another sort, renders the offender liable to a penalty of 20*l.*, and not less than 5*l.* There are other penalties enacted against bakers for having ingredients for adulteration on their premises. [COFFEE, ADULTERATION OF, *Suppl.*]

ADVERSA'RIA, among the ancients a kind of common-place book, or journal, in which were inserted any remarkable occurrences. The term was first adopted by the Romans, because their common-place books '*adversâ* parte scriptis implérentur,' and contained various incidental remarks made by different parties.

ADVERTISEMENTS. Since the publication of the article on this subject, the duty on all advertisements, in newspapers and other periodicals, has been entirely abolished,—a measure which has given general satisfaction, and affords great advantages to the commercial and advertising public. It was repealed in 1853.

ADVOCATES (i. 194). In the Middle ages there were various classes of advocates, which the peculiar customs of the time, on the decline of the Roman empire, called into existence.—*Feudal Advocates* were military officers, whose duty it was to lead the vassals of the church to war, and instruct them in their duties. They were generally in possession of lands of the church, which they held in fee, and did homage to the bishop or abbot of the see. *Military Advocates* were appointed for the defence of the church, rather by arms and authority than by pleading or oratory.—*Juridical*

Advocates were those who, from attending classes in the court of the feudal lord, or county court, became judges themselves, and held courts of their vassals thrice a year, under the name of the *tria placita generalia*. Other kinds of advocates, of a subordinate character, are also mentioned in our law-books; as, for instance, the patrons of churches, who had the presenting a person to a vacancy, were termed *Advocates*. (Blount's *Tenures*.)

ÆRA'RIUM (Lat. *æs*, money), among the Romans the public treasury of the state, to the purposes of which the temple of Saturn at Rome was first applied; and the keepers, who were chosen from the emperor's life-guard, were called *Præfecti Ærarii*. Under Augustus the Ærarium was supported by annual voluntary contributions; but on these proving inadequate, the twentieth part of all legacies and inheritances, except those which fell to the next of kin, was contributed.—*Ærarius* was an officer instituted by Severus for the distribution of the money given in largesses to the soldiery or people. The term was also applied to any soldier who received pay. (Adam's *Roman Antiq.*)

A'ERATED WATERS are liquids of an effervescent quality, produced by the action of carbonic acid gas. 'In a chemical sense (says Arbuthnot on Aliments) effervescence signifies an intestine motion, produced by mixing two bodies together that lay at rest before, attended sometimes with a hissing noise, frothing, and ebullition.' Thus the sudden commixture of soda and tartaric acid (an alkali and an acid) will produce a sharp ebullition, which is called effervescence; and the mixture, which is a very cool and refreshing drink, may be called aerated water. But the forced combination of carbonic acid gas with water, or other liquid, renders the aid of a machine necessary. In a late work on aerated waters, published by Dr. Venables, the operation of an apparatus, invented by Bakewell, is fully described, and also the composition necessary for the production of different kinds of aerated water. The process is not confined to mere cooling drinks, such as soda-water, but is applicable to all cases where it is intended that water should have an effervescing action imparted to it, whether of a tonic, diuretic, aperient, or other quality. In the case of soda water the carbonic acid gas is the result of chemical action between carbonate of soda and sulphuric acid. In the description of Bakewell's apparatus, for effecting the combination of these two agents, Dr. Venables says, that 'for a gallon of water to be impregnated to the extent of five atmospheres would require about six ounces of carbonate of soda, and four ounces of sulphuric acid.'

AEROG'NOSY (Gr. ἀὴρ air, and γνῶσις knowledge), that part of physics which treats of the properties of air, and of the important part it performs in the great operations of nature.

AEROL'OGY. [AIR.]

A'EROLITHS (Gr. ἀὴρ air, and λίθος a stone), a kind of air-stones, or meteoric bodies, which are known to be continually falling through the air to the earth from unknown distances. Of their physical or meteorological origin nothing certain is known, although many elaborate and ingenious disquisitions have been written on the subject. Mr. Brande inclines to the hypothesis that these bodies might come from some volcano in the moon; while others maintain that they are floating in myriads around the sun, or through the vast regions of space, and that, on coming within the attraction of this globe, they are precipitated to the earth. It is remarkable that they are similar in composition to all the iron found native, and in fact consist of iron and a portion of nickel. A mass of native iron was discovered by Professor Pallas in Siberia which weighed 1600 pounds; and one was discovered in Peru of the enormous weight of fifteen tons. From their similarity and actual identity with meteoric stones, there is every reason to conclude that such masses have, at some period or other, fallen from the distant regions of space. In truth, the descent of such stones has been historically noticed both in ancient and modern times. Pliny relates that a shower of stones (for such he calls these falling meteors) fell in Lucania. Instances in modern times are still better authenticated. In 1762 many stones fell near Verona in Italy, some of them weighing 200 and 300 lbs. in weight. They fell with a violent explosion in a sloping direction, and in calm weather; and the ground where they fell appeared to be ploughed up and burnt. The occurrence was witnessed by three or four hundred persons. Since that period the descents of aeroliths have been regularly authenticated, and are very numerous. In 1812 several of these meteors fell in Normandy. They consisted of fiery globes of great splendour passing through the air, which were followed by violent explosions that were heard at a great distance. The largest weighed nearly twenty pounds, and the number which fell exceeded 3000. That these meteoric phenomena are of cosmical origin has been satisfactorily confirmed by Denison Olmsted, at Newhaven, in Connecticut, who proved that during the celebrated display of aeroliths, in November 1833, they all emerged from precisely the same quarter of the heavens, in the vicinity of the star γ, in the constellation Leo; and that they did not deviate from this particular point, although the star changed its apparent height and azimuth during the observation; and this clearly demonstrates that these meteoric bodies are independent of the diurnal or rotatory motion of the earth. In the two following years, during the same month, similar displays of aeroliths were again seen in the same quarter of the heavens. It appears, moreover, that all the meteors observed in the United States, between 35° and 42° N. lat. came from the same point of space in the direction in which the earth was moving at the time. From so many interesting facts it may be safely inferred that these aeroliths, fire-balls, or shooting stars, as they have been differently named, belong not to the earth or its atmosphere; but, as Dr. Lardner observes, 'they are masses of matter moving like the planets in the celestial spaces, subject to the gravitating attraction of the sun; that the earth encounters them occasionally, either striking directly upon them, or approaching so

close to them, that they are drawn, by the terrestrial attraction, first within the atmosphere, and afterwards to the surface; and that the shooting stars, which rush athwart the heavens without falling on the earth, are the same class of bodies which do not either directly strike the earth, or come so close to it as to be drawn to its surface by its attraction.'

In a clever article in the *Quarterly Review* of December, 1852, much interesting information is given respecting these strange bodies. The writer says: 'There exist in China authentic catalogues of the remarkable meteors of all classes, aerolites included, which have appeared there during a period of 2400 years. To give an idea of the minuteness of these records—the translation of which we owe to the lamented Ed. Biot—it is enough to mention that in the three centuries, from A.D. 960 to 1270, not fewer than 1479 meteors are registered by the Chinese observers, who seem to have been officially employed for this purpose. It is only of late years that the science of Europe has placed itself in communication with those extraordinary documents. * * * It is one of the many instances furnished by science of the ancient truths, long obscured or discredited, coming suddenly into fresh light, and receiving illustration from new and unexpected sources. The chemist's crucible and the eye of the mineralogist disclosed results as to these stones which no conjecture could have anticipated, and eventually compelled the belief so long and obstinately denied.' And again: 'These bodies afford us glimpses into the history of matter foreign to the world in which we ourselves live. They represent another domain of nature; yet connected with our own by the signal fact, also derived from them, that the matter is the same in kind as that which surrounds us here. One-third of the whole number of elementary substances enter into their composition; iron, as we have seen, largely predominating over the rest, and associated occasionally with minerals resembling closely the hornblende, augite, and olivine of our rocks. While the materials, however, are thus alike, they differ much in the manner of arrangement and proportions of their parts from any compound bodies hitherto known to us; and are of deep interest, therefore, as representing an aggregation, distinct from that of the earth, of the same elements diffused beyond its sphere. Almost might we venture to call them specimens of planetary matter; since that which exists in the space intermediate between the earth and other planets may have the same relation to both. And, indulging in such speculation, we might go yet further, and find argument in these facts for that great theory of modern astronomy which regards all the planets as formed by the successive condensation of rings of nebulous matter, concentric with the sun—the matter being the same, but variously aggregated, from physical causes varying during the condensation of each planet.'

A'EROMANCY (Gr. *ἀὴρ* air, and *μάντις* a prophet), a species of divination practised by the ancients, and especially by the Greeks, from whom it was received by the Romans. According to this art it was pretended that future events could be foretold from certain phenomena or noises in the air.

ÆRU'GO, the sub-acetate of copper, usually called verdigris; but common English verdigris is a spurious kind, in which the sulphate of copper and the acetate of lead are substituted.

Æ'THRIOSCOPE (Gr. *αἴθριος* clear, and *σκοπέω*, to view), an ingenious instrument for measuring the relative degrees of cold, produced by the pulsations from a clear sky.

ÆTI'TES (Gr. *ἀετὸς* an eagle), a variety of ironstone, commonly known as eaglestone. It is formed of concentric or sub-concentric layers, round a nucleus, which is often loose, and when shaken produces a noise.

AGAL'LOCHUM, or AG'ALLOCH, the aloes-wood, of which there are three varieties,—the *calamba*, the common *lignum* aloes, and the *calambaz*. The first is light and porous, and so strongly impregnated with a fragrant resin, that it may be moulded with the fingers; the second variety is denser and less resinous; and the third is the aloes-wood used by cabinet-makers and inlayers of fancy cabinet-work. (Craig's *Techn. Dict.*)

AG'APÆ (Gr. *ἀγαπὴ* love), love-feasts, or feasts of charity, first instituted among the primitive Christians in celebration of the last supper, at which a liberal contribution was made by the rich to feed the poor. They were generally kept in the church after the usual services were over; and the ceremony concluded with the kiss of charity between the different sexes. St. Chrysostom gives a circumstantial account of these love-feasts. After the first three centuries these meetings degenerated into licentiousness, and the abuses committed in them became so notorious, that the holding of them in churches was solemnly forbidden at the council of Carthage, A.D. 397. (Nuttall's *Archæol. Dict.*)

AGAPEM'ONE (Gr. *ἀγαπὴ* love, and *μονὴ* an abode), the general residence of a peculiar sect of religionists, established in 1845 at Charlinch, near Taunton, in Somersetshire. They were originally a branch of the sect called Lampeters, and their peculiar tenets are, that the day of grace and prayer is passed, and the time of judgment arrived. They carry out their belief by perpetual praises to God, but do not adopt the use of prayer. The members enter into a community of property, and profess to live in a state of constant joyousness and mutual love. In 1849 a singular trial, connected with this institution, occupied the Court of Exchequer for three days. It was an action brought by Miss Louisa Nottidge, a maiden lady of large property, against her brother and brother-in-law, for forcibly abducting her from the Agapemone, and confining her in a lunatic asylum. It appeared that the plaintiff and her three sisters, all ladies of considerable property, had become converts to the opinions of this sect, and taken up their abode in the Agapemone, where the sisters were married to three of the clerical rulers of the establishment; but Miss Louisa Nottidge, who had remained single, was forcibly taken away by the two defendants, and sent to a lunatic asylum;

for which alleged wrong she obtained 50*l.* damages; thus showing that she was not insane, and that the law, as the Chief Baron observed, tolerated every sect, however absurd, that did not inflict a social wrong, or openly violate the laws of morality.

Since that period, the sect has been sending its missionaries to different parts of the country, in order to gain converts. On the 26th of Sept. 1856, two of these missionaries called a meeting at the Hanover Square Rooms, in London, when one of them addressed the assembled visitors, in an unintelligible jargon, relative to the mission of a certain 'Brother Prince,' been made a 'vessel of mercy' for the human race, and who was to supersede the Gospel by some new religious dispensation which he had been specially commissioned to teach. The other missionary then stated that he would explain who brother Prince was. He was by nature, he said, a child of wrath, but by grace a vessel of mercy. The testimony of brother Prince was concerning what Jesus Christ had done by his own person. Some 11 years ago, he said, the Holy Ghost fulfilled in brother Prince all that he came to be and to do. The speaker proceeded to allude to a second spiritual manifestation which, he said, occurred at the Agapemone about five years ago, in which case the phenomenon was exhibited in the person of a woman—a prophetess—'not privately, but in the presence of all.' These sentiments were uttered in the midst of general execration; and a resolution was unanimously passed, 'That the statements which had been made that evening were contrary to common sense, degrading to humanity, and blasphemous towards God.'

AGARIS'TA, a name given by Cuvier to a genus of lepidopterous insects of the Sphinx family. In botany it is a genus of plants, which are natives of S. America and the Mauritius, of the order Eniaceæ.

AG'ENHIM, a term used in the Middle ages for the name of a guest who had lodged at an inn three nights, when he became one of the family. The host was responsible for his conduct, and bound to see that he did not offend against the king's peace. (*Bracton.*)

AG'GER, in ancient engineering the name of a military road, the middle part of which was formed into a ridge. It was also an earth-work, thrown up for the attack or defence of towns or camps; a wall erected against the sea to keep it within bounds; or any tumulus, mound, or barrow raised upon the grave of a deceased warrior.

AGNO'MEN (Lat. *ad* and *nomen*, to a name), among the Romans, was a name of distinction, or honorary appellative, conferred upon an individual for some illustrious action or meritorious conduct. It was generally appended to the *nomen*, or family name, as in the case of Lucius Cornelius Scipio, who received the agnomen of Asiaticus, for his heroic deeds in Asia; precisely as his brother Publius Cornelius had been honoured with the name of Scipio Africanus, for his successes in Africa. The great Quintus Fabius Maximus also received the appellation or agnomen of Cunctator (*retarder*), from his cautious policy in retarding the impetuosity of Hannibal, and declining battle. (Nuttall's *Class. Dict.*)

AGO'NES (Gr. ἄγω to contend), among the classical ancients, were games celebrated at the public festivals, which consisted, as the word implies, of a series of disputes or contests, either intellectual or corporeal. Thus poets, painters, and musicians had their agones as well as the athletæ. At Rome, the *Agon Capitolinus*, instituted by Diocletian, was celebrated every four years on the Capitoline Hill. Here the poet Statius recited his Thebaid, and gained the *agonisma*, as the prize given to the victor was called. The name of the place where the games were celebrated was termed *Agonium*.

AG'ORA (Gr. ἀγορά a place of assembly), among the Greeks a kind of public square, market, or general rendezvous, similar to the forum of the Romans. These squares were surrounded by spacious and double porticoes, embellished with statues and niches. The senate-house, the basilica, and other public buildings, were usually connected therewith.—The *Agoranomi*, who received their name from the above, consisted of ten magistrates at Athens, who protected the interests of the city and port. It was their duty to examine whatever was exposed for sale in the public market-place (or agora); a certain tribute or toll being paid by all who brought anything to the market for sale.

AGRICULTURE (i. 315), (Lat. *agricultura*, culture of the land) has been held in the highest estimation from the remotest ages of antiquity, especially among the Egyptians, Chaldæans, Persians, Phœnicians, and Greeks. The Romans were so devoted to agriculture, that their most illustrious commanders were sometimes called from the plough. To be a good husbandman was highly reputable; and whoever cultivated his ground negligently was subject to the animadversion of the public censors. The principal instrument of Roman agriculture was the *aratrum* or plough, of which there appear to have been various kinds; some of them with wheels, mould-boards, and coulters. The plough was drawn by oxen yoked by the neck or horns, and driven by the same person who guided the plough. The *bidens* was an instrument with two teeth for breaking clods; and the *securis*, or axe, was used for pruning vines, &c. The harrow, rake, and hoe were also adopted. In the Middle ages agriculture had ceased to be held in the high estimation it deserved; and the cultivators of the soil were the mere vassals or serfs of the feudal lords. But during the last and present century agriculture has been gradually assuming that importance to which it is justly entitled; while science and art are daily contributing their aid in developing its great national resources.

AGRICULTURAL CHEMISTRY (i. 312-15). Within the last few years, our knowledge of chemistry, as applied to agricultural science, has wonderfully advanced. The mind of man, both in Great Britain and on the Continent, has directed its full force to the chemical investigation of the organised bodies of animals and plants; and also

to a closer examination of the processes which are in never-ceasing operation. Of what these bodies consist, and by what processes man can accelerate their growth, or preserve their existence, are the important objects at which chemical research endeavours to arrive; and therefore a few observations, as supplementary to the brief treatise on Agriculture already given, and founded on recent experiments, may be generally interesting.

In the vegetable creation the chief stages through which plants have to pass are germination, growth, florescence, seed-bearing, and withering. Thus a grain of seed (sown in moist earth, with the chemical ingredients of germination) shoots into a plant, puts forth leaves, flowers, and seeds, and then dies away. This is the universal law of Inscrutable Wisdom. When these plants have advanced so far as to produce seed (that is, new bodies capable of life), they have fulfilled their appointed destiny; they sink to decay, and the chemical compounds of decomposition contribute in turn to the renovation of other living organisations. Those changes by which not only the external form, but the whole essential nature of bodies are altered, are termed chemical processes. By the agency of these processes bodies may be so fundamentally changed in form, colour, solidity, smell, &c., that new bodies, with entirely new properties, are produced. Over the whole surface of the globe we behold chemical action eternally in operation: not only in the vegetable kingdom, but in the inanimate mineral itself; for we find that the hardest stone, by the process of chemical action, gradually becomes friable, and, crumbling into smaller and smaller fragments, at length assumes the form of earth. An esculent bulb, the potato for instance, when planted in the ground, becomes soft, acquires a sweet taste, then rots, and at last altogether disappears; but in this there is nothing more than a chemical process. This seeming annihilation of the potato bulb is only a chemical metamorphosis. From the combined products of putrefaction the creative powers of nature produce a fresh plant, full of new life, together with all the varied substances occurring in it—starch, oil, sugar, &c.,—which eventually contribute to the chemical manuring of the soil.

In agricultural statics, the general rule is to 'make the soil rich and active when it is not so, and keep up this constitution where it already exists.' By 'rich,' the agricultural statist, chemically speaking, means the totality of the food for plants contained in a soil; by 'active,' the combination of powers and circumstances which adapt the soil for the growth of plants, and render the food applicable to this condition. The *richness* of a soil depends upon material substances; its *activity* upon certain chemical and physical changes, which take place in different ways. What is the nature of these changes, and how they are modified by the composition of the soil, by the manuring, the tillage, the climate, the kind of crop, &c., have all to be discussed and explained on the principles of agricultural chemistry.

By the soil becoming 'richer,' an increase in its productiveness is necessarily implied; and to effect this important object, the soil must be so treated that it shall contain a sufficient store of all the different chemical substances which plants generally consume in the development of their roots, stems, leaves, flowers, and seeds; and this store must be so regularly distributed in every part of the field, that the plants meet with abundance of chemical nutriment. These chemical substances chiefly consist of nitrogen, carbon, phosphoric acid, lime, and potash. By the soil becoming more 'active,' we generally mean that it must be brought more and more into such a crumbling and soft state, that it may be perfectly accessible to moisture, air, and heat; that the two processes of decomposition and weathering may proceed actively and uninterruptedly; that the nurture may be supplied most abundantly; and that the roots of the plants may be enabled to spread freely in every direction.

'Many patches of promising soil (says Delamer, in his useful little work on Kitchen Garden Agriculture) will throw out magnificent crops of vegetables the first or second season they are cultivated; but it requires the pulverising frosts of several winters, and the cleansing labours of several springs and summers, to make a piece of crude clay garden ground even begin to do its best. There must be a constant and gradual admixture and working in of lighter and chemically different materials; such as sand, well-pulverised calcareous earth, spent tan from tanners' pits, bog earth, heath mould, anything in short, which will help to make vegetable mould, and of course, when it can be had, vegetable mould itself. To give depth to soils naturally shallow is of necessity a work demanding both time and the power of acquiring the materials wherewith to do it. Good garden ground especially should be a mixture in just proportions, if possible, to the depth of a yard or more, of chalk, clay, sand, and what our learned men call *humus*, and French gardeners and vine-dressers *terreau*, but for which there is no better English name than vegetable mould. All rich vegetable mould is the result of its having been the grave-yard of innumerable generations of vegetables, whose mouldering bodies supply the basis on which future production and reproduction are to take their stand. Soils, whether sandy or clayey, in which *humus* is deficient, must be liberally supplied with it, or its elements, before they can become the scene of any satisfying horticultural action.' Thus bone-dust, pounded bones, bones in almost any shape, are essential manures for most culinary plants. The vast quantities of liquid manure which are annually wasted, might be also applied to the soil. Hogsheads of chamber-slops, soapsuds, and other out-scourings of a family, are often thrown away and lost, while things in the garden or the field are starving.

The two important substances in nature which contribute to the manuring of the soil, and the growth of crops, are *nitrogen* and *phosphoric* acid. Agricultural chemistry must therefore devote its most active energies to discover, in the great treasury of nature, whether there are not in existence

natural bodies in which these two substances lie concealed. Chemistry (says Stockhardt) has already displayed its activity in various directions. In the vast strata of Chili and Peru extensive deposits of a salt, rich in nitrogen, have been discovered; and in certain rocks of England and N. America enormous deposits of fossilised bones, rich in phosphate of lime, are now being gradually brought into use. It has been found that certain of the strata of the southern counties of England, as the *crag* of Norfolk, Essex, and Sussex, contain very large quantities of fossil bones. On a portion of the cliffs on the sea-coast of Norfolk and Sussex, these fossiliferous strata are exposed to the washing of the sea. The beds of these strata extend as a subsoil for some distance inward, and in such places the fossils are dug up. The fossil bones contain more than 50 per cent. of the phosphate of lime, and are extensively used in the manufacture of super-phosphate. Some myriads of tons are now dug up annually; (see the Journal of the *Royal Agricultural Society*). In the marls of the upper greensand of Surrey, similar fossils have been found; and their discovery arose from an investigation into the causes of the peculiar fertility of the soil at places where this formation developed itself on the surface. In Saxony, near Oelsnitz, a large quantity of fossil bones of the elephant and rhinoceros were lately discovered at the bottom of a clay-pit; and many thousand years must have passed away since the primeval possessors of these remains were there entombed; yet, even at this distance of time, these bones contained gelatine; for, upon being heated, they became black, and diffused the same ammoniacal and empyreumatic odour as fresh bones. On a chemical analysis, one of the specimens yielded 2¼ per cent. of nitrogen, which may be considered as equivalent to 14 per cent. of gelatine. Thus we find that the fossil bones in question retain nearly half of their original properties.

There is little doubt that ammonia, which may be designated as *putrefied nitrogen*, is that constituent of manures which in most cases imparts the stimulating influence to vegetation. Ammonia is a gas of an alkaline nature and pungent odour. The compounds of ammonia with acids have the appearance and properties of salts, and are called ammoniacal salts. Those best known are nitrate of ammonia, sulphate of ammonia, carbonate of ammonia (salt of hartshorn), bismate of ammonia, and chloride of ammonia, or sal-ammoniac. The most recent researches in the walks of agricultural chemistry have demonstrated that not only the ammonia conveyed into the earth, but that added to the atmosphere in the gaseous form, acts most powerfully as a stimulant and a manure. In a late experiment with wheat, for instance, the growth was so increased by air containing ammonia, that 19 oz. of grain and 22 oz. of straw were gathered; while only 11 oz. of grain and 12 oz. of straw were obtained from an equal quantity of wheat plants grown in ordinary air. Similar results were produced in testing other vegetable productions.

Among other important discoveries of recent times, which the researches of agricultural chemistry have brought to light, is that of the ammoniacal gas produced from coal. In the ordinary manufacture of gas, thousands of tons of ammoniacal salts are now obtained from the formerly waste wash-water of coal gas, which affords a manure containing the same constituents as the best guano, and acting with equal vigour upon vegetation. Its great consumption in English agriculture is now affording daily evidence of the importance of this chemical agency; and hence arises the great national problem—what are the best means of appropriating to agriculture the enormous masses of manuring matters contained in the cesspools and sewers of our large towns, which are not only entirely lost, but are allowed to be injurious and even destructive to animal life? In France, the night-soil of dwellings, the offal of slaughter-houses, and the refuse of manufactories, are already converted, in large quantities, into valuable manures, so concentrated, that they are not only readily applied to domestic agriculture in every part of the country, but are even exported to the West Indian colonies, to be applied to the plantations of cotton and sugar; while in England the application of these valuable manures is comparatively neglected. In London, the great centre of scientific and manufacturing skill, the contents of our cesspools, our privies, and our sewers, which contain a mine of agricultural wealth, are not only allowed to run to waste, but, what is still more abominable, they are permitted to mingle with and pollute the very water of the noble river which contributes to the commercial glory of this great empire. It is thus converted into one great cesspool, which contaminates the air we breathe, and impregnates with the seeds of disease the very water that we drink. Unfortunately there was too much truth in the observation of the Chinese philosopher, who said that he had always been told that the English were the wisest people on earth; but that the fact did not agree with his own practical observations; for he found that the valuable manures of the public cesspools, which in China were applied with religious care to the culture of the land, in England were mingled with the very water which the people drank!

(*Journal of the Royal Agricultural Society;* Delamer's *Kitchen Garden;* Stockhardt's *Agricult. Chem.*, &c.)

AGRICULTURAL IMPLEMENTS. If in England we have not made any very rapid advances in agricultural chemistry, we may at least claim some credit for the invention, and successful introduction, of many agricultural implements in farm operations. The impulse which the Exhibition of 1851 in Hyde Park gave to mechanical ingenuity in this important department of our national industry, though not so universally known as it ought to be, is altogether incalculable. It aided in carrying out the great objects of the Agricultural Society, which, about eighteen years ago, commenced the annual show of agricultural implements, with the distribution of prizes for the best inventions. And we may now inquire what has been the result since

that period. The summing up of the Agricultural Jury of the Great Exhibition has given the necessary information, and thus briefly enumerates the advantages thence arising :—'Seeing that the owner of a stock-farm (says the report) is enabled in the preparation of his land, by using lighter ploughs, to cast off one horse in three, and, by adopting other simple means, to dispense altogether with a great part of the ploughing,—that, in the culture of crops by the various drills, horse-labour can be partly reduced, the seed otherwise wanted partly saved, or the use of manures greatly economised; while the horse-hoe replaces the sand-hoe, at one-half the expense,—that, at harvest, the American reaping machines can effect thirty men's work; whilst the Scotch cart replaces the old English waggon with exactly half the number of horses,—that, in preparing corn for man's food, the steam threshing machine saves two-thirds of our former expense; and in preparing food for sheep, the turnip cutter, at an outlay of one shilling, adds eight shillings a head in one winter to the value of sheep,—lastly, that in the indispensable but costly operation of draining, the materials have been reduced from 80*s.* to 15*s.* per acre, to one-fifth, namely, of the former cost, —it seems to be proved that the efforts of agricultural machinists have been so far successful, as, in all these main branches of farming labour, taken together, to effect a saving in outgoings of little less than one-half.'

AGYR'TÆ (Gr. *ἀγυίρω* to gather together), among the classical ancients a sort of strolling impostors, something like our modern gipsies, who pretended to tell fortunes or cure diseases, by means of charms and other pretended mysteries.

AIGUILLE', an instrument used by military engineers for piercing a rock for the lodgment of powder, or to mine a rock, so as to excavate and make roads.

AI'GULET, is a naval term for a lashing rope, intended for securing the breeching of a gun, when on board ship. It is usually fifteen or sixteen fathoms long.

ALA (Lat. a wing), in botany the hollow turning between the branch or stalk of a plant and the leaf. It is also a term applied to the parts of leaves called lobes. In anatomy it applies to the cartilages of the nostrils, and the cartilaginous parts of the ear.

ALABASTER (i. 358). The nature and origin of this beautiful stone have been briefly noticed; but from the many ingenious modes recently contrived for adding to its beauty and general appearance, it may now be considered an article of manufacturing importance; although it has not been brought into use in England so much as on the continent, where artistic pursuits are more general. In Italy, for instance, its manufacture is extensively followed; especially in Rome, Milan, Florence, and Leghorn. From the beauty, uniformity, and size of the material, the Italians are enabled to work it into ornaments of considerable bulk. The principal aids employed in the manipulating process are fine chisels, rasps, graving tools, and files. The larger masses are cut with saws into blocks of various shapes, which are afterwards submitted to the turning lathe, and with the necessary tools worked into artistic shape and beauty. M. Dallamoda, of Rome, has lately produced a most exquisite *tazza* in Egyptian alabaster; and the ruler of Egypt (whence the finest raw material was anciently exported) has been induced to open the rich quarries of Oriental alabaster, which have been so celebrated from the remotest antiquity,—the name having been originally derived from the Egyptian town of *Alabastrum*, the produce of which is a peculiar kind of limestone, with a stalagmitic formation, and a beautiful translucent tint. It is not, however, in the artistic manufacture alone that the qualities of this material exist. There have been different plans adopted for producing the most pleasing variations in colour and general appearance, and even effecting changes in its very properties. Such are the advantages which the discoveries of modern art are constantly eliciting.

AL'ALITE, a variety of Augite or stone (*λίθος*), which is the production of *Ala*, a village in Piedmont. It occurs in prismatic crystals, either colourless or green, and is of a shiny lustre, and usually striated longitudinally. It contains silex, 57·50; lime, 16·50; magnesia, 18·50; iron and manganese, 6. Its specific gravity is 3·31. It fuses before the blow-pipe into a semi-transparent colourless mass. (Craig's *Tech. Dict.*)

ALAN'GIÆ (Malabar, *alangium*), a natural order of tropical trees, allied to the Myrtaceæ, or myrtles. Its roots are aromatic, and its fruit, which is a drupe, is eatable.

ALARUM AGAINST FIRE. In 1851 a kind of fire-alarm telegraph was introduced into the city of Boston, in America. The system has thus been described :—'About forty cast-iron signal-boxes are distributed about the city, in convenient proximity to the whole of the streets, and about fifty miles of telegraphic wire connect these boxes one with another. When a fire occurs, resort is had to the nearest signal-box; a crank handle is turned, by which a signal is communicated to a central office. Signals are then transmitted from this central office to the seven districts into which the city is divided, and seven fire bells are thus rung, the mode of ringing being such as to indicate the division in which the burning house is situated. Thus the whole city may be made acquainted with the locality of a fire in a very few minutes after it has commenced.'

In many continental towns, especially in Switzerland, watchmen are stationed in high towers, and they blow a horn at regular intervals during the night, to show that they are attending to their duties, and that all is well. When a fire occurs, the church bells ring, the tocsin is sounded, and the whole place thus thoroughly aroused.

ALBA'NIA (i. 367-372), like the adjoining district of Montenegro, may now be considered as a mere nominal dependency of the Sultan. The Beys appointed by the Porte often take upon themselves either to enlarge or contract their possessions as they please, and even to throw off their nominal allegiance. Here the Greek and Catholic Christians, as well as the Mohammedans, still live in a half-savage state, and under varied forms of

government. The modern population consists of various tribes of Turks, Servians, Bulgarians, Valaques, Greeks, Jews, &c. The native Albanians, however, are the most numerous. They are always armed, and give laws to the rest. Inured to hardships, and accustomed to pillage, their bodies are robust, and their looks haughty and penetrating. The retaliative law of blood for blood is in full operation among them, and the pleasure which they have in shedding "the purple stream of life" marks the characteristic ferocity of the whole race. From the present aspect of affairs in Turkey, there is little doubt of the greatest part of the Albanian territories, like the province of Montenegro, becoming, at no distant period, entirely independent of the Porte.

ALBIN (Lat. *albus* white), a white-coloured mineral, of the Apophyllite variety, which consists of an aggregation of crystals, possessing a laminated structure.

AL'CADÆ, an extensive family of web-footed birds, including the auks, puffins, penguins, gillimots, &c. They are characterised by having the bill more or less arched; the sides compressed; feet entirely webbed; and the hinder toe minute or wanting. The wings are not adapted for flight, but perform the office of fins. (Craig.)

ALCI'DES, a genus of coleopterous or beetle insects, which are included in the genus Amerhinus of Cuvier. The body is oval, or almost cylindrical, and convex beneath.

ALCOHOM'ETER (Arab. *alcohol*, and Gr. *μέτρον* a measure), an instrument for ascertaining the quantity of spirits contained in any vinous fluid.

ALCYONID'IUM (Gr. *ἀλκυόνιον*, the foam of the sea), a genus of marine Algæ, sometimes considered as a variety of the Alcyoneæ,—a group of polypiferous Acrita, which are similar in character and form to the sponges, but more distinctly allied to animal life.

ALDERSHOT CAMP. This new military encampment stands near the high road from London to Portsmouth. It is pleasantly situated between Farnborough and Farnham, and may be easily reached from either place, the distance from London being between thirty and forty miles. The progress of events in the Crimea convinced our government and the military authorities, that henceforward it would be advisable to have a permanent camp for the proper training of our troops. In 1854 a grant of £100,000 was obtained for the purpose, and a portion of the large moor bearing the name of Aldershot was immediately purchased. The camp thus formed was seven square miles in extent, and was divided into the north and south camps, the former to contain eight and the latter twelve thousand men. From a parliamentary paper issued in August, 1856, it appears that further purchases were made. The total quantity of land bought up to that date being 7062 acres, at a cost of £135,445, and while the number of men stationed there in 1855 amounted only to 12,245, in 1856 it reached 28,181. This of course includes the foreign legion. The troops collected in this new encampment have been reviewed by the Queen and the military authorities. The locality is said to be unhealthy, on account of the bad system of drainage adopted. There are several places of historical interest in the neighbourhood, amongst which may be mentioned the birth-place of William Cobbett. The district is also celebrated for the quality and quantity of the hops which it produces. (See *Aldershot, and all about it, by Mrs. Young.*)

ALEC'TO, in classical mythology the name of one of the three Furies, who is described by Virgil as having her hair and her dark wings covered with her victims. She is sometimes called by the poets *Cocytia Virgo*, from Cocytus, a river of hell.

ALECTOR'IDES, or ALECTOR'IDÆ (Gr. *ἀλέκτωρ* a cock, and *εἶδος* like), a family of large American gallinaceous birds, without spurs, and destitute of the rich colouring of the European and Asiatic races.

A-LEE, a term used in nautical language, to signify the side of a vessel opposite to the wind; that is, opposite to the side on which it blows. Thus the helm of a ship is said to be *a-lee*, when pressed close to the lee side; and helm-a-lee is an order to put the helm to the lee side.

ALEM'BROTH, a compound of the bichloride of mercury and sal-ammoniac, from which the white precipitate of mercury is made. It is the philosopher's salt, or salt of wisdom of the old alchemists.

ALEURI'TIS (Gr. *ἄλευρον* flour), a genus of plants, of the order Euphorbiaceæ, which have the appearance of being covered with flour. The species *triloba*, of this genus, furnishes the candle nuts of the South Sea Islanders, which yield them food; and when strung together form a kind of torch.

ALFET, the Saxon name for a cauldron of boiling water, wherein an accused person plunged his arm up to the elbow, by way of trial or purgation. The custom was a species of ordeal, to show the guilt or innocence of the party. (*Ducange.*)

ALGÆ (i. 451). This term is applied to a tribe of Cryptogamous plants, in which is comprehended the sea-weeds, many of the fresh-water weeds, the Confervæ, &c. All Algæ seem to require either actually to be submerged beneath the water, or, at least, to be supplied with a very considerable amount of moisture.

Their arrangement has been founded on several peculiarities, but that which appears to be the most perfect, is also the most apparent, viz. the arrangement by means of colour. Algæ are either brown, or olive, red, or green, and accordingly the arrangement of the present day is as follows:—

MELANOSPERMEÆ; or, Black seeded.
RHODOSPERMEÆ; or, Red seeded.
CHLOROSPERMEÆ; or, Green seeded.

Of these three groups, the Melanosperms contain the orders Fucaceæ and Ectocarpaceæ. The Rhodosperms include the orders Rhodomelaceæ and Ceramiaceæ; while the Chlorosperms have a wider range, and comprise the Batrachospermeæ, the Chætophoraceæ, the Confervaceæ, the Zygne-

mataceæ, the Desmidiaceæ, and the Diatomaceæ. The Characeæ are not admitted among the Algæ, on account of their organization, which, according to Professor Harvey, entitles them to a position among the Hepaticæ.

As far as has been ascertained, the Melanosperms are purely marine, and the Rhodosperms almost exclusively so, while the Chlorosperms are scattered indifferently among all waters, marine, lacustrine, or fluviatile, and are found clinging in almost any position, and to any object that affords them a quiet resting-place and abundant moisture. The colours are liable to slight changes according to the position of the plant, and the amount of light to which it has access. For example, some of the Melanosperms assume a tolerably bright green in certain positions, part of the blue rays, which serve to compose the green of the Chlorosperms, get into the Rhodosperms, and turn them purple, while a portion of the red rays of the Rhodosperms change the colour of some of the Chlorosperms to a violet tint, which under certain circumstances assumes quite an iridescent character.

The most common of the Melanosperms is the Bladder-wrack (Fucus vesiculosus), so called on account of the air-cells with which its fronds are studded, and which serve to float the plant to a proper position in the water. This is a most useful plant, kelp being extracted from it in great quantities; it is also used for manure. The valuable substance called iodine is plentifully extracted from it, and, to sum up its good qualities, the inhabitants of Northern Europe feed their cattle upon it. There is another species of Fucus, the Notched wrack (Fucus serratus), which is also used for the same purposes, but not so largely.

Many of the Melanosperms, such as the Tangle, or Oar Weeds of our own shores, are very large, measuring some ten or twelve feet in length; but they shrink into insignificance beside their gigantic congeners of the tropical seas, whose forms are more to be compared to trees than to weeds. One of them, the Nereocystis, although its stem is no thicker than whipcord, measures three hundred feet in length, and is so strong as to be used by the natives for a fishing line. Again, a single plant of the Macrocystis covers several hundred superficial yards as it floats on the water; and this astonishing mass of vegetation is anchored to the bottom of the sea by a stem that has been known to measure one thousand five hundred feet in length, or nearly four times as long as St. Paul's is high.

Some of the Melanosperms, such as Alaria esculenta, are eaten raw by human beings. The leaf is prepared by stripping off the hard flat sides, leaflets, and membrane, and the remaining midrib is then fit for consumption.

The Rhodosperms include among themselves some of the most beautiful of the Algæ, both to the unassisted eye and for the microscope. Among them may be mentioned the lovely genus Delesseria, with its noble species D. Sanguinea, the genera Nitophyllum and Plocernium, which are in great request for the formation of artificial landscapes made of real sea-weeds. The singular Corallines are also among the Rhodosperms. These curious plants lay up in their structure a considerable amount of lime, and, when dead and dry, so closely resemble many of the arborescent zoophytes, that they were at one time placed in the animal instead of the vegetable kingdom.

Among the Rhodosperms, one genus, the species Chondrus crispus, is in very general use among pastry-cooks to form jellies and similar articles. When dried, it goes by the name of Carrageen Moss, and is in some request as a strengthening substance for invalids. It is also used as a size for calico printers, as food for calves when mixed with milk, and for pigs when boiled with water and meal.

The Chlorosperms are the most comprehensive group of the Algæ, and embrace many singular forms. Most of them are of a bright grass green, not at all resembling the olive green that sometimes occurs in the Melanosperms. Some of them, as Paphyra, are tinged with purple of a very peculiar tint, and in others the green is almost supplanted by a brownish hue. Among the best examples of Chlorosperm Algæ, are the genera Ulva, Enteromorpha, Cladophora, and Bryopsis.

Of these, Ulva latissima is found on almost every rock on the coasts, and, when dried, forms the common lava of the shops.

The Desmidiaceæ and Diatomaceæ are well worthy of notice, but require the aid of a microscope to develope the beauty of their forms. In the confined space that can be given to an article on this subject, it would be useless to attempt a detailed description of these beautiful and singular forms. The reader, therefore, is referred to works that are especially devoted to them, such as Lindley's 'Vegetable Kingdom,' Harvey's 'Marine Algæ,' &c.

ALGERIA, or ALGIERS (i. 459-468). During the years 1846–47, the French were engaged in continual hostilities with the brave Arab chief, Abd-el-Kader; and the losses which France had sustained, in blood and treasure, were enormous. But a fortunate event occurred at the close of 1847, which completely turned the tide of affairs in her favour, and tended permanently to consolidate her political authority over the whole country. The forces of Abd-el-Kader had become so reduced by perpetual conflicts with the French on the one side, and the Moorish troops on the other, that he could no longer meet his enemy in the open field, though he did not cease to harass them by his daring incursions. He was at length, however, reduced to such straits that he came to the resolution of delivering himself up to the French, sooner than be sacrificed to Moorish ferocity. Yet the last act of his military career was, perhaps, the most brilliant of all his romantic achievements. On the night of the 12th of December, with a mere handful of his devoted adherents, he suddenly attacked the Moorish encampment, and entirely routed the immense army it contained. Being, however, subsequently overpowered by numbers, and hemmed in on all sides by increasing masses, he was gradually driven on the frontier of Algeria; and the frightful weather impeded his military operations. On the 21st of

December, however, the fords of the Moulouia became practicable; and the baggage and families of his brave followers proceeded towards the plains of Triffa; the Emir's determination being, after seeing them safely on the French territory, to cut his way through the Moorish army with such of his adherents as should continue to support him. The published report of the Duke d'Aumale, commander-in-chief of Algeria, thus communicates the result:—'He threw himself into the country of the Beni-Massur,' says the duke, 'and sought again to take the road to the south, which the emperor of Morocco had left free; but, surrounded on that side by our cavalry, he trusted to the generosity of France, and surrendered, on condition of being sent to St. Jean d'Acre or Alexandria.'—Thus terminated the military career of this daring chief, who, for fourteen years, had been one of the most formidable antagonists of the French. But notwithstanding the promise which had been given by General Lamoricière, and ratified by the Duke d'Aumale, the Emir, instead of being sent to one of the places named in the compact, was conveyed, with his suite, to Toulon, where he arrived on the 29th of January, 1848. He was afterwards removed to the chateau of Amboise, near Boise, where he was detained as a captive, until December, 1852, when Louis Napoleon gave him his liberty, and allowed him to reside, on a pension, at Broussa, in Syria, where he now lives in retirement.

Since the removal of Abd-el-Kader from Algeria, the French power may be said to be consolidated; and the increasing prosperity of the country may be dated from that event. Civilisation has been making rapid progress. The natives, under the auspices and protection of the French, have applied themselves to useful industry. They have been forming roads and bridges, and have entered largely into mining operations. They have also erected near 4000 stone houses, and planted upwards of a million of fruit trees. The total imports, in 1849, amounted to 65,251,707 fr., and the exports to 9,802,405 fr. According to the census of 1851, the population was 2,561,003; comprising 2,429,720 natives, and 131,283 Europeans. In 1852 there were three native colleges, 593 schools for the elder pupils, and 851 primary schools for native children.

ALHA'GI (Arab.), a shrub or genus of plants which produces manna. It is on this plant that manna is found in Mesopotamia and other Asiatic territories. In hot weather the manna exudes from the leaves and branches, and at first resembles drops of honey; but it soon thickens into solid grains about the size of coriander seed. By the Arabian writers it is believed to be a supernatural production.

ALI'GNEMENT, a military term, which means the formation of a body of troops in straight line. The alignement of a camp signifies the relative position of the tents, &c., so as to form a straight line from any given point.

ALIWAL, a village on the banks of the Sutledge, which has been stamped with historical celebrity from the great victory obtained by the British troops over the Seiks in 1846; the former being commanded by General Sir Harry Smith.

AL'KALHEST (Arab.), the name of a universal solvent which the old alchemists professed to have discovered. The word was first used by Paracelsus, and subsequently adopted by his followers, who pretended that this solvent was to have the power of resolving all compounds into their elementary constituents. Thus not only metals were to be dissolved, but every substance in nature. Sir H. Davy, however, has remarked, that if such a solvent really existed, nothing would be so much dreaded by modern chemists. It would prevent the analysis of every mineral into which it entered, and would be like the fabled water of the Styx, which petrified everything it touched.

ALKALIES, FIXED, DECOMPOSITION OF (i. 486-7). Before the time of Sir H. Davy the alkalies and alkaline earths were looked upon as simple elementary bodies, and treated as such in all chemical works. But owing to his persevering skill and successful experiments, it was discovered that fixed alkalies (as potash, soda, &c.) were metallic oxides, or compounds of certain metals and oxygen. When this distinguished chemist first communicated to the Royal Society, in 1809, the successful results of his experiments in the decomposition of the fixed alkalies by galvanism, it excited the greatest sensation in scientific circles. It was considered that the experiments which he detailed were sufficient to produce an alteration in the established notions of chemical affinity, and to prove that the formation of all compounds might depend on the electrical state of the materials of which they were composed. In the sciences kindred to chemistry, however, the knowledge of the nature of the fixed alkalies, and of their liability to be decomposed by galvanic action, is calculated to unfold many of the great secrets of nature, and to explain the vast changes which matter itself is constantly undergoing. It may, in fact, open entirely new views, and lead to the solution of many important problems in geology, by showing that agents may have eternally operated in the formation of rocks and earths, which were not before supposed to exist.

Sir H. Davy, in proceeding with his experiments on a certain quantity of potash in a state of igneous fusion, applied an electric power, which was produced from a galvanic battery of 100 plates of six inches square, highly charged, when a most intense light and a column of flame were exhibited, which appeared to be owing to the development of combustible matter; and when the order was changed, so that the alkali was brought in contact with the negative side of the battery, aëriform globules, which inflamed the atmosphere, rose through the potash. Being, however, unable to collect the products of decomposition by this means, Davy took a small piece of pure potash, moistened a little by the breath, and placed it upon an insulated disc of platina, connected with the negative side of a battery, consisting of 100 plates of six inches and 150 of four inches square, in a state of intense activity;

and a platina wire, communicating with the positive side, was brought in contact with the upper surface of the alkali. A vivid action soon commenced. The potash began to fuse at both its points of electrization; and small globules, having a high metallic lustre, and precisely similar in appearance to quicksilver, made their appearance; some of which burnt with explosive and white flame. These globules, which appeared to be metallic, were the basis of the potash, which was thus found to be composed of that peculiar base and oxygen. So strong is the attraction of this basis of potash for oxygen, that it discovers and decomposes the small quantities of water contained in alcohol and ether, even when they are carefully purified. Moreover, when a globule of this base of potash was exposed to the atmosphere, it attracted oxygen, and a white crust formed upon it, which proved to be pure potash. Sir Humphry determined by experiment that its specific gravity was to that of mercury as 10 to 223, which gives a proportion to that of water nearly as 6 to 10; so that it is the lightest metallic body known. Its properties are peculiar; and numerous experiments and illustrations are to be found in the "Philosophical Transactions" of that period. For instance, when a globule of this alkali is made to touch a globule of mercury about twice as large, they combine with considerable heat; the compound is fluid at the temperature of its formation; but when cool it appears as a solid metal, similar in colour to silver. If this compound be exposed to air, it rapidly absorbs oxygen; potash, which deliquesces, is formed; and in a few minutes the mercury is found pure and unaltered. Again, when a globule of the amalgam is thrown into water, it rapidly decomposes with a hissing noise; potash is formed; hydrogen is disengaged, and the mercury remains free. It was also found that *soda*, when acted upon in the same manner as the potash, exhibited analogous results. It was discovered that its base, like that of potash, was white and opaque, and had the lustre of silver. It was found very similar, in its more obvious properties, to the base of potash; but it had a greater specific gravity, being to that of water nearly as nine to ten. In oxygen gas it is found to produce a white flame, and sends forth bright sparks. In chlorine gas it burns vividly, with numerous scintillations of a bright red colour. When amalgamated with mercury, the amalgam will combine with other metals.

In order to ascertain the proportions of the bases and oxygen in the two fixed alkalies, Sir H. Davy made several curious and ingenious experiments; from whence he concludes that 100 parts of potash consist of about 84 basis, and 16 oxygen; while 100 parts of soda consist of about 76 or 77 basis, and 24 or 23 oxygen; or that potash may be considered as consisting of 6 parts basis, and 1 of oxygen; and soda, of 7 basis, and 2 oxygen. On the whole, Sir Humphry, conceiving the bases of the two fixed alkalies to be metals, undertook to name the one *potassium*, and the other *sodium*; thus adopting a termination which, by common consent, has been applied to all other newly-discovered metals. But the expensive and rather troublesome methods of procuring potassium, or sodium, by galvanic action, have, since the time of Davy, been superseded by a much more convenient and productive furnace operation: the first being founded on the decomposition of potash at a white heat by charcoal. [POTASSIUM.] Soda is prepared by a similar process, the carbonate of soda being used in the place of carbonate of potassa. [SODIUM.] (*Philosophical Transactions*, &c.)

ALKALIM'ETER (Arab. *alkali*, and Gr. *μέτρον* a measure), an instrument for ascertaining the quantity of alkali contained in the soda or potash of commerce, or for determining the quantity of sulphuric acid necessary to their saturation.

AL'LAGITE, a massive kind of mineral, with a conchoidal fracture. It is opaque, and of either a brown or green colour, the green soon changing into a dark grey or black, and the brown into pink-brown or pearl-grey. Its specific gravity is 3·7. It scratches glass. The green allagite is fusible before the blow-pipe into a black pearly glass; and the black into a violet-hue coloured glass. Its component parts are,—manganese 75·00; silica, 16·00; carbonic acid, 7·50; with a small portion of lime. (Craig.)

ALLAN, Sir WM., R.A., Scottish Limner to her Majesty, and president of the Royal Scotch Academy, was born at Edinburgh in 1782. He was originally brought up as a coach painter, and afterwards educated at the Trustee's Academy in Edinburgh, when he had for his fellow-students Sir David Wilkie, Alex. Fraser, and others who afterwards became eminent in art. After having made his way to London, the first picture he sent to the exhibition was "A Gipsy Boy and Ass." After having paid a visit to St. Petersburgh, he returned to London, and the next picture which he sent to the Royal Academy Exhibition, in 1809, was called "Russian Peasants keeping their Holiday." He sent some other admirable pictures for exhibition; but he was so disheartened by his ill success, that he had given up all hopes, when Sir Walter Scott stepped in, and started a lottery of one hundred subscribers at ten guineas each, for the purchase of his last picture of the "Circassian Chief selling Slaves to a Turkish Pacha." His lottery was successful, and imparted a fresh impulse to his talents. He produced a great variety of subjects, and among others, the "Murder of Abp. Sharpe on Magus Muir," which was purchased by Mr. Lockhart, and has since been engraved. He then confined his efforts to Scottish subjects, and produced, among others, "John Knox admonishing Mary Queen of Scots" (exhibited at the Royal Academy in 1824), and the "Regent Murray shot by Hamilton of Bothwellaugh," which was purchased by the Duke of Bedford, at the Academy Exhibition, for 800 guineas, and procured him the rank of A.R.A. in the Royal Academy. In 1831 he still further distinguished himself by his pictures of "Lord Byron reposing in the House of a Turkish Fisherman, after having swum across the Hellespont;" by his "St. Valentine's Morn, from the Fair Maid of Perth," and by his portrait of "Sir Walter Scott seated in his Study

at Abbotsford." In 1835 he was made a Royal Academician; and in 1837 he was selected to fill the chair of the Royal Scottish Academy of Painting, Sculpture, and Architecture. Of the numerous works which afterwards made their appearance the principal were,—"Peter the Great teaching his Subjects the Art of Ship-building" (which was a commission from the Emperor of Russia), and his last great work, the "Battle of Waterloo," which was sent to the Exhibition at Westminster Hall. At the death of Wilkie, Allan was appointed his successor as Limner to the Queen for Scotland,—an office which conveys the honour of knighthood to its possessor, which Allan received in 1842, with a small salary. His death took place in 1850, at his house in Great Queen-street, Edinburgh. He died of bronchitis, in his painting room, in front of the last great national picture which he was executing —the "Battle of Bannockburn."

AL'LANITE, a massive, dark brown, and opaque mineral, found in West Greenland, and so called from Mr. T. Allan, of Edinburgh. When in powder it is of a greenish grey. It is in prismatic crystals; fracture uneven, small, conchoidal, with a shining resinous metallic lustre. According to the minute and accurate analysis of Stromeyer, its constituents are as follow:—silica, 33·02; alumina, 15·23; protoxide of cerium, 21·60; protoxide of iron, 15·10; protoxide of manganese, 0·40; lime, 11·08; water, 3·00.

ALLIANCES. Among the most memorable alliances of modern history may be mentioned the Triple Alliance between England and the States-General against France, for the defence of the Netherlands. This league was made on the 28th of January, 1668; and Sweden afterwards became a party to it. Hence its name. It was soon followed by the Grand Alliance between England, Germany, and the States-General in May, 1689. Spain and Savoy afterwards joined it. The Quadruple Alliance between England, France, Germany, and Holland, was signed at London in 1718. Its objects were to guarantee the succession of the royal families in France and England, and to secure the settlement of the Spanish monarchy. During the celebrated Revolutionary War, various alliances were made by different European powers; some with, but more against, France. The final alliance at Toplitz, between Russia, Austria, and Prussia, was made in September, 1813; and on the 3rd of October, in the same year, a treaty was signed between Austria and England. At the close of the war, the sovereigns of Austria, Prussia, and Russia, entered into a convention called the Holy Alliance. It was ratified on the 26th of September, 1815, and was thus named from the fact that it commenced, '*In nomine Dei.*' By this compact these rulers pledged themselves to govern upon Christian principles, with the view of making peace permanent.

The most remarkable alliance in modern history, and the one which promises to produce the most beneficial effects for mankind at large, is that between England and France, which grew out of the Eastern dispute of 1853, and bids fair to rival all former alliances, both in ancient and modern times, because it is a bond of union between the two nations, and not a mere formal treaty between the governments. This alliance was ratified on the 3rd of April, 1854; and on the 26th of January, 1855, Sardinia became a party to it. Its results were most glorious; for in less than two years after the treaty was ratified, Russia was humbled, and compelled to enter into a treaty of peace, which was concluded in March, 1856.

AL'LOCHROITE (Gr. ἄλλος another, and χρῶμα, colour), a peculiar mineral found in Norway, which is a variety of the dodecahedral garnet. In colour it is brown, green, grey, or yellow, with a vitreous lustre. It strikes fire with steel, and readily fuses before the blow-pipe into a brilliant black glass. It consists of silica, 35·00; alumina, 8·00; lime, 30·5; oxide of iron, 17·00; oxide of manganese, 3·5; and carbonate of lime, 6.

ALL-SAINTS, or ALL-HALLOWS' DAY, the 1st of November, a day of general commemoration of all those saints and martyrs in honour of whom individually no day is assigned.

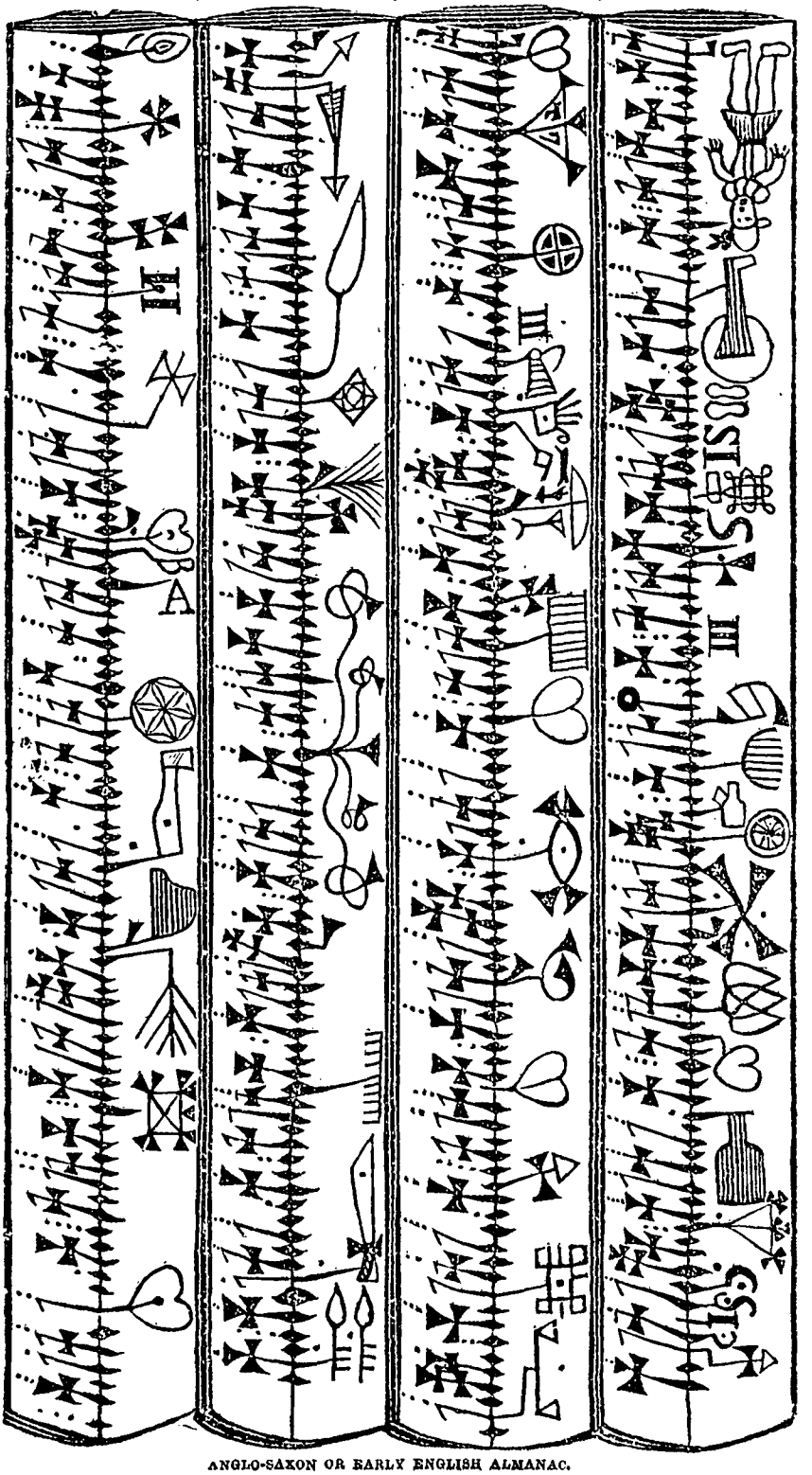
ALMA, a river of the Crimea, which has become celebrated for the severe conflict that took place on its banks between the Anglo-French army and the Russians, on the 20th of September, 1854, when the latter were repulsed with great slaughter. It rises in Mount Tchatin Dagh, and flowing westward, empties itself into the Black Sea, at Kalamita Bay, seventeen miles north of Sebastopol.

AL'MAGEST (Arab. *al* the, and Gr. μεγίστη the greatest), the title of a celebrated work, compiled by Ptolemy Lagus of Egypt. It consisted of a great variety of problems on astronomy and geometry, accompanied with many valuable observations, tending to elucidate both sacred and profane history. When the Arabs translated it into their own language, by order of the califf Al Maimon (A.D. 800), they gave it the above title.

ALMANACS (*i.* 516) were in early use among the northern nations of Europe, for the computation of time, and were first introduced into this country by the Danes. They had various names assigned to them; as Clogs, Bacculi Annales, Primstocks, Primstaries, Primstaffs, Runstocks, Scipiones Runici, &c. The Danish or Runic almanacs, or staffs, as they are sometimes called, were clogs or sticks marked with the golden number, the festal days, holidays, sports, &c.; the festivals being marked at the top by drinking horns, and the holidays by symbolic or hieroglyphic signs. Our Anglo-Saxon ancestors calculated by the increase of the moon, which was denoted on square pieces of wood about a foot long; and the calendars of the Papal era were filled with the saints'-days, festivals, &c.; some of which were extremely curious. The annexed representation of an Anglo-Saxon or early English almanac, or Staffordshire Clog (for which we are indebted to Plot's History of Staffordshire, where these clogs are still to be met with), will afford an excellent illustration of our early mediæval almanacs. (*See Engraving.*)

In this clog almanac the year is vertically di-

JAN. FEB. MAR. | APRIL. MAY. JUNE. | JULY. AUG. SEPT. | OCT. NOV. &c.



ANGLO-SAXON OR EARLY ENGLISH ALMANAC.

vided into four distinct quarters; the first of which comprehends January, February, and March; and the second, third, and fourth compartments are allotted to the other quarters of the year. Every day of each month is marked; and the characters there inscribed are usually symbolic of the festivals they are intended to represent. They may be thus summarily explained:—

JANUARY.—1, Emblem of Circumcision, for new year's day.—6, a *star*, for Epiphany.—13, a *cross*, for Hilary.—25, an *axe*, for St. Paul.

FEBRUARY.—2, a *heart*, for Purification.—3, *B* for St. Blase.—14, a *true lover's knot*, for Valentine's day.—24, a *leg*, for St. Matthias.

MARCH.—1, a *leek*, St. David's.—2, a *branch*, St. Chad.—12, St. Gregory.—25, a *heart*, Annunciation.

APRIL.—3, a *dart*, for Richard.—23, a *spear*, for St. George.—25, a *diagram*, for St. Mark.

MAY.—1, a *green branch*, for May day.—3. a *cross*, Invention.—19, a *pair of tongs*, for St. Dunstan.

JUNE.—11, a *rake*, for St. Barnabas.—24, a *sword*, for St. John.—29, *keys*, for St. Peter.

JULY.—2, a *heart*, for the Visitation.—7, a *T crossed*, for Thomas à Becket.—15, a *shower of rain*, for St. Swithin.—20, III., Margaret.—22, Mary Magdalene.—25, James.—26, Anne.

AUGUST.—1, Lammas day.—6, a *cross*, for Transfiguration.—10, a *gridiron*, for St. Lawrence.—15, a *heart*, for Assumption.—24, Bartholomew.

SEPTEMBER.—1, St. Giles.—8, a *heart*, Nativity.—10, a *cross*, exaltation of the Cross.—21, St. Matthew.—29, *scales* for St. Michael.

OCTOBER.—13, a *man* (with his feet upwards), Translation of Edward the Confessor.—18, St. Luke.—25, *shoes*, St. Crispin.—28, *S. I.* Simon and Jude.

NOVEMBER.—1, All Saints.—2, All Souls.—6, St. Leonard.—11, St. Martin.—16, St. Edmund.—20, Edmund the King.—23. St. Clement.—25, a *wheel*, St. Catharine.—30, a *cross*, St. Andrew.

DECEMBER.—6, St. Nicholas.—8, a *heart*, Conception of the Virgin.—13, St. Lucy.—21, a *spear*, St. Thomas.—25, Christmas.—26, St. Stephen.—27, *I*, St. John.—28, Childermas.—29, Thomas of Canterbury.

For the preceding explanations we are chiefly indebted to Mr. Gough, the antiquary. It appears, however, that these mediæval almanacs frequently differed in their hieroglyphical representations. In the Norway clogs, for instance, St. Martin's day is denoted by a goose, because then it was usual to feast on a fatted goose,—a custom which was afterwards observed at Michaelmas. In other almanacs St. Simon and St. Jude's day was indicated by a ship, because those saints were fishermen. St. George's day was represented by a horse, in allusion to his military profession. The Slaughter of the Innocents was sometimes denoted by a drawn sword; and St. George, by a schoolmaster holding a ferula in his hand, because at this spring-time of the year the rustics were accustomed to send their children to school; or rather, perhaps (as Hawkins says) "because he founded the famous chaunt, and whipped his scholars well."

AL'MANDINE (Fr.), in mineralogy, a variety of precious garnet, crystallised in rhombic dodecahedrons, of a beautiful red colour, and sometimes tinged with blue or yellow. It is usually translucent, and generally transparent.

ALMARI'CIANS, a sect of Christians who were the followers of Almaric, professor of logic and theology at Paris, in the 13th century. He opposed the worship of saints and images, and other dogmatical errors of the Romish Church; but Mosheim and other learned men considered him as a Pantheist, who maintained that the universe itself was God.

ALPHABET, MANUAL. [DACTYLOGY.]

ALPHONSINE TABLES, a series of astronomical tables, the principal object of which was to correct the tables found in Ptolemy's Almagest, which at the time were found no longer to agree with the heavens. [ALMAGEST.] These celebrated tables were compiled under the direction of Alphonso, the illustrious king of Castile, in 1252, who is said to have spent 400,000 crowns in their completion. The preface was written by Alphonso's own hand.

ALTAR-SCREEN, the back of the altar, from which the canopy is suspended, and separating the choir from the chapel and presbytery. The altar-screen was usually built of stone, and composed of the richest tabernacle-work of niches, finials, and pedestals supporting statues of the tutelary saints.

AL'TARAGES, a term formerly applied to the offerings made upon the altar, which were the emoluments of the priests. They were, in truth, those voluntary oblations out of which a portion was assigned by the rector to the vicar.

ALU'DELS (Gr. *α*, and Lat. *lutum*, without lute), subliming pots used in chemistry, without bottoms, and fixed into one another, as many as there is occasion for without luting. At the bottom of the furnace is a pot, which holds the matter that is to be sublimed, and at the top is a head to retain the flowers that rise up. (Quincy.)

AL'VEOLITES (Lat. *alveolatus* honey-combed, and Gr. *λίθος* a stone), a genus of fossil zoophytes, large at the one end, and tapering at the other, and composed throughout of small hemispherical cells. (Craig.)

AM'ABYR, or AM'BAVYR, a custom, among our ancestors, of paying money to the lord of the manor on the marriage of a virgin—"pretium virginitatis domino solvendum." The custom is said originally to have existed in Wales, where amabyr was paid to the prince.

AMBARVA'LIA (Lat. *ambiendis arvis*, going about the fields), Roman festivals celebrated in honour of Ceres, and held in April and July. The priests who conducted the ceremonies were twelve in number, called *Fratres Ambervales*; and they offered up sacrifices for the fertility of the ground, which were termed *Sacra Ambarvalia*, because the victim, or *hostia Ambarvalis*, was carried through the fields before the reaping of harvest commenced. These processions went three times through their fields, crowned with oak leaves, singing laudatory hymns to the goddess. They afterwards poured wine and milk upon an altar,

and sacrificed a sow. The procession called *Amburbium* (round the city) was something similar to the Ambarvalia. (Adam's *Rom. Antiq.*)

AMBER has been described (i. 589-590) as an electric carbonaceous mineral, which is often found in beds of lignite. Its use was formerly confined to the manufacture of necklaces, and the preparation of amber varnish; but of late years this material has been most extensively applied to the manufacture of the mouth-pieces of hookahs and meerschaum pipes. Indeed in such high repute are these mouth-pieces held in the East, that nearly all the amber produced in Prussia is sold to the Turks, among whom these articles are in great request, and fetch very high prices. It is deserving of mention, that in the Turkish department of the Great Exhibition, there were four amber mouth-pieces for pipes, which were valued at 1000*l.* We are all aware that among the Turks it is deemed an act of great courtesy to hand an amber pipe to a stranger guest. The general belief, however, that amber is incapable of communicating anything infectious, may perhaps serve to explain the cause of its being held in such high estimation. In Prussia the manufacture of amber, for fancy ornaments, has been carried on more extensively, perhaps, than in any other part of Europe; for amber, in fact, may be considered as the native production of that country, whence large supplies are obtained, especially on the shores of the Baltic. Indeed the amber-pipes of Prussia have for many years past afforded a considerable revenue to the government. At Dantzig there is a most splendid exhibition of specimens, which occupied M. von Roy, an amber merchant, more than twenty-five years in collecting. The largest piece of amber at present known, weighing 18 lbs., is in the royal cabinet at Berlin; and we may judge of its value when we are told that some American merchants lately offered 5000 dollars for a piece of amber 15 lbs. in weight.

The different colours of amber are derived from local chemical admixture. The amber contains fragments of vegetable matter, and from these it has been ascertained that the amber-pine forests contained four other species of pine, besides the Pinites succifer. According to the German naturalist, Goppert, it would appear that "all the amber of the Baltic comes from a coniferous tree, which, to judge by the still extant remains of the wood and the bark at different ages, approaches very nearly to our white and red pines, although forming a different species." The amber tree of the ancient world (Pinites succifer) abounded in resin to a degree far surpassing that manifested by any extant coniferous tree; for not only were large masses of amber deposited in and upon the bark, but also in the wood itself, following the course of the medullary rays, which, together with ligneous cells, are still discernible under the microscope, and peripherally between the rings.

In the working of amber some nicety is required. It is usually turned in a lathe, and then polished with whiting and oil, and rubbed with a flannel. By a due and judicious application of heat, the material may be hardened. A compound of amber, asphaltum, turpentine, and linseed oil, produces that beautiful black varnish used by coachmakers.

AM'BITUS (Lat. *ambio* to go about soliciting), the custom, among the Romans, of soliciting or making interest for offices, honours, &c. The candidates were in the habit of going about the city (as the term implies) to solicit votes in all public places and assemblies. At the Augustan period this practice was a complete trade, and the amount of bribery at length amounted to the enormous sum of 80,729*l.* per tribe.

AMBRO'SIA, Grecian festivals in honour of Bacchus, similar to the Brumalia of the Romans. Among the classical ancients ambrosia was considered as the food of the gods, and that it had the power of conferring immortality on all who tasted it. The ancient poets relate many wonderful instances of its virtues and powers. (Nuttall's *Class. Dict.*)

AMBRY, a term formerly applied to the place where all the valuables of housekeeping were deposited; as the plate, costly vessels, arms, &c. The aumonery, or almonry, formerly attached to an abbey, as at Westminster, was originally devoted to similar objects; and they are doubtless cognate words.

AMERICA, CENTRAL (iv. 331), and the NAVIGABLE ROUTES across the ISTHMUS.—That narrow slip of territory, known as Central America, which for ages has been immersed in comparative barbarism, appears to be destined, ere long, to be the scene of many great and important changes, both of a political and commercial character. The country was first discovered by Columbus in 1502; and it belonged to Spain till 1821, when Guatemala first declared its independence. The different states then formed a confederation, which was dissolved in 1839.

Geographically speaking, Central America forms the heart and centre of two mighty oceans on the east and west, and is the great connecting range of the two vast continents of North and South America. It is situated between lat. 7° and 22° N., and long. 78° and 94° W. It comprehends the republics of Costa Rica, Guatemala, Honduras, Nicaragua, and San Salvador, the population of which, in 1850 and 1851, exceeded 2,000,000; thus distributed—Costa Rica, 138,000 inhabitants, with an area of 23,000 square miles; Guatemala, 971,450, with 21,000 square miles; Honduras, 368,000, with 40,000 square miles; Nicaragua, 247,000, with 40,000 square miles; and San Salvador, 363,000, with 24,000 square miles. There is also Mosquitia, governed by Indian chiefs, with a population of 6000, and an area of 23,000 square miles; and likewise British Honduras, with a population, in 1848, of 11,066, with an area of 62,700 square miles.

The isthmus varies in breadth from 70 to 100 miles, and is in length, from S.E. to N.W., about 1000 miles. The south part extends about 280 miles from the Gulf of Parita to the country lying between the Gulf of Nicoa and the Rio de St. Juan; while it extends north between the British settlement, Belize, and the Mexican states. The plain of Nicaragua is about 175 miles in extent, and the great lake of that name, which covers a very large

surface, is not above 134 feet above the Pacific Ocean. Some parts of the land are extremely mountainous, being traversed by the great Andes range, with peaks about 8000 feet in elevation. The table-land of Guatemala generally ranges about 5000 feet above the sea, but descends very rapidly towards the Pacific. It extends from the Isthmus of Chiquimula to Tchuantepec, in Mexico, and also into the peninsula of Yucatan. There are numerous volcanoes scattered about the high table-lands, and earthquakes are common. Guatemala contains two immense volcanoes 12,000 feet above the sea. There are several rivers, all of which flow from north or east. The principal lakes are Nicaragua and Leon, through which a communication between the Atlantic and Pacific Oceans has long been projected, and of which we shall speak hereafter.

The whole country is extremely rich in vegetable, animal, and mineral productions; especially in the precious metals. Alcedo stated that from the mine of Tisingal, in Costa Rica, as much wealth had been extracted as from that of Potosi, in Peru. Among other numerous productions are cochineal, indigo, cocoa, sugar, cotton, coffee, log-wood, mahogany, various balsams, drugs, &c. On the coasts there is abundance of fish, known to the Indians by the names of the Berugati (50 lbs. weight), Robalo, Bagre, Parvo, Hurel, Barbu, Corvina, Hurello, Mero, Cassou, Cominata, Rayo, &c. All these are good eating, and easily caught. There are extensive beds of pearl oysters near the shores of the Island of San Miguel, or Isla del Rey, the largest of the Pearl Islands, in the Bay of Panama, just outside the gulf; and the natives of the villages on the island occupy themselves very profitably in diving for them.

On the Pacific coast of the isthmus there are scarcely any Indian inhabitants;—they are chiefly Granadians of Spanish descent, not numbering more than 1000; or negroes, of whom there is a large population. The Atlantic coast of Darien is inhabited by the Tule or San Blas Indians, a fine athletic race, though of low stature, with copper-coloured complexion and long black hair. Dr. Cullen, who explored this interesting region, says, that during his various journeys in the Darien, in 1849, 1850, 1851, and 1852, he was treated by these Indians with the greatest affection and the most unlimited hospitality. The same Indians turned back Mr. Lionel Gisborne, the engineer who was appointed to explore the country, for surveying the best navigable route, because they mistook him and his party for Americans.

Many remains of a civilised people have been found in these regions, such as ancient cities, temples, &c.; and they are supposed to have existed for ages anterior to the occupation of the Spaniards.

Ever since the time of Columbus the earliest attention of mankind has been unceasingly directed to the practicability of effecting a passage which should afford a navigable and ready communication between the Atlantic and Pacific Oceans; and now the world at large seems intent on solving this great geographical problem. What the despotism of Spain had for ages prevented, and the political contentions of the American colonists have long retarded, the important discovery of the El Dorado of the western world—the gold-bespangled regions of California—and our increasing intercourse with China, Japan, and Australia, will tend materially to promote. The treaty of Washington, of 1850, has done much towards guaranteeing the rights of the independent states of Central America, by promising neutrality to the projected ship passage through the isthmus. The British government has also taken measures, with that of the United States, to provide an equal guarantee with that of the Nicaraguan convention for the Isthmian canal; and the Emperor of the French has engaged to give his cordial co-operation.

The practicability of effecting a junction between the Atlantic and Pacific Oceans appears to be generally admitted; but the principal difficulty is in selecting the most eligible route. Various lines have been proposed; but the ISTHMUS of PANAMA or DARIEN is the section of the American continent the most in favour with projectors and geographers. Though this route across the isthmus would unquestionably be the shortest, it appears that there are innumerable difficulties in the way of a commodious water communication, arising not only from the lofty mountains which intervene, but from the shallowness of the bays in each ocean, which would be fatal to the navigation of even moderately-sized vessels. The river Chagre, whence a canal must proceed, empties itself into the Atlantic Ocean about lat. 9° 18′ N., and 80°, 35′ W. long.; and it is navigable for boats about twenty leagues to the town of Cruces; but unfortunately the bar at the entrance of the river will not admit a vessel drawing more water than ten feet. A chain of mountains also runs through the isthmus, following the curvature of the coast, and the road from Cruces to Panama winds round the sides of lofty hills. Supposing a ship canal to be cut at the foot of these hills, pursuing the sinuosities of the ravines, it would still be necessary for the engineer to make use of immense arches in some places, and deep tunnels at others, in order to obtain a level; and he would also have to carry the canal over an elevation of some hundred feet. But even admitting that human ingenuity and labour should surmount these physical obstacles, and that a large ship canal should be completed from Cruces to Panama, there still remains the great impediment of shallow water in the Bay of Panama, where none but flat-bottomed boats, of one or two feet in draught, can approach the shore. The anchorage place for all vessels of large size is at two small islands, called Perico and Flaminco, distant about seven miles from the city of Panama. In fact, the Bay of Panama is nothing more than an open roadstead, and the lading and unlading of vessels is tedious and expensive. We may therefore come to the conclusion that the Isthmus of Panama, from its geographical position, can never admit of an extensive navigable communication; and although it may be destined to enjoy a considerable future trade, through the probable medium of a

railway, it can never become the great commercial emporium of Central America.

Notwithstanding the many difficulties of the Darien route, Mr. Gisborne, an official engineer, was appointed in 1853, along with Dr. Cullen, to explore and survey the intermediate country. His report was in some respects favourable, although there has been no attempt to act upon it. In speaking of the harbour of San Miguel, on the Pacific side of the isthmus, and that of Caledonia on the Atlantic side, Mr. Gisborne says that they "are both excellent as the termini for a ship navigation on the largest scale, with Port Escoscés as a harbour of refuge, should circumstances occur to render its use necessary. The Savannah River has six fathoms or upwards in depth at low water, for a distance of seven miles from its mouth, the effect of the tide reaching, on the Lara tributary, eleven miles above this, or eighteen miles from Darien Harbour, leaving a distance of thirty miles to Caledonia Bay, *which is the actual breadth of the Isthmus between the tidal effect of the two oceans;* that the summit level is ascertained to be 150 feet, and is formed by a narrow range of hills, having a gradually rising plain at their foot at each side." The writer then proposes to make a cut 30 feet deep at low tide, 140 feet broad at bottom, and 160 feet at low water's surface. The cost of the undertaking was estimated, by Mr. Gisborne, at £12,000,000.

There are, however, two other routes across the isthmus, situated to the eastward of the Isthmus of Panama, which have been considered by many as possessing superior advantages for navigable communication. The one is from the Gulf of Darien along the rivers Atrato and Naipi, in the province of Choco, in New Granada, to the Gulf of Cupica in the Pacific Ocean. From the port

NAVIGABLE ROUTES OF DARIEN.

of Cupica to the head of the navigable waters of the Naipi, there is only the distance of twenty-four miles, and the country between the two places is a dead level. A navigable canal might therefore be cut without difficulty. The circumstance of the waters of the Naipi being so near the port of Cupica, gives to this route an important advantage.

The other route is through the same province, but in a southerly direction along the canal of Raspadura, which unites the rivers Atrato and San Juan, — the former entering the Gulf of Darien, and the latter falling into the Pacific Ocean in lat. 4° 5′ S. This communication has existed since 1788, and when the rains are abundant, canoes, loaded with produce, can pass by it from sea to sea. The distance between the navigable waters of San Juan and Atrato is only thirteen leagues; and from the Atlantic to the Pacific, following the course of the ravines, it is only eighty leagues. There is no doubt but that a navigable water communication between the two oceans might here be accomplished, either by re-opening and enlarging the canal of Raspadura, or by cutting a new one between the Atrato and the San Juan.

More than two centuries ago the Spanish government knew that in this province the cutting of a canal of a few leagues would effect a navigable communication between the two oceans; and that during the rainy season, when the valleys were overflowed, canoes passed with the produce of the country from one sea to the other. But such was the national jealousy of the Spaniards, that they prohibited, under the penalty of death, all communication whatever by that route. The curate of Novilla, however, being ignorant of the interdiction, or pretending to be so, assembled all the Indians of his parish, and in a short time cut a canal between the rivers Atrato and San Juan, since known by the name of the Raspadura. Large canoes, loaded with the produce, chiefly cocoa, actually passed along it; but the communication was immediately stopped by order of the government, and the life of the unlucky curate had nearly fallen a sacrifice to his enterprising spirit.

The important navigable passage, however, to which the attention of the civilised world has been directed is the one by the Lake of Nicaragua, in the province of Costa Rica, which lies considerably to the north-west of the Bay of Panama. Of the practicability of forming a navigable passage along this route there can be little doubt; but, on account of the distance being so much greater than the Isthmus of Panama, little attention till of late has been bestowed upon it; so completely has the public mind been directed to the narrow Isthmus of Panama and Darien. In the Nicaragua route, however, nature appears already to have completed three-fourths of the undertaking. The lake itself is 130 miles long, and about 40 broad, lying between 11 and 12 degrees N. lat. The river San Juan connects it with the Atlantic on the east; and the Lake Leon, with its small tributaries on the west, presents the greatest facilities for uniting the Nicaragua with the Pacific.

NAVIGABLE ROUTE OF NICARAGUA.

After the bar of San Juan is passed there is excellent anchorage in four and six fathoms water, and it is stated that there are no obstructions to the navigation of the river but what may be easily removed. At present schooners and brigs of considerable burden sail up the river into the lake.

The Lake Nicaragua presents few difficulties to navigation. Its elevation above the Pacific has been calculated at 134 feet, or 11 feet per mile; the difference in height of the two oceans, as ascertained by Humboldt, being about 22 feet. Its surplus waters are carried by the river San Juan to the Caribbean Sea, which river is in many places 15 fathoms deep. In the lake there are numbers of islands, creeks, and harbours, all presenting great facilities to commerce. At the western extremity of the lake is a small river, which communicates with the Lake of Leon, distant about eight leagues. This lake is 50 miles long and 30 broad, and of depth sufficient for the larger trading vessels. It is about 13 miles from the Pacific, and five from the river Tosta, which enters that ocean. The height of the intervening ground is not more than 50 feet above the level of the sea. According to Thompson, the historian of Guatemala, the highest elevation is not more than 19 feet. Indeed, the greatest portion of the ground between the two lakes and the sea is a perfect level. Thus nature has already provided a water conveyance through the Isthmus of Costa Rica to within a few leagues of the Pacific,—the whole distance not exceeding 250 miles. Moreover the governments of Great Britain and the United States, in 1852, entered into a joint treaty with the republic of Guatemala, for the purpose of facilitating the construction of a ship canal, or railway, to connect the two oceans at this point. This convention guarantees a free passage to all nations, as well as the independence and neutrality of the province in case of war. The magnitude of this undertaking can bear no comparison to the vast results that may be anticipated to the commerce and civilisation of the world. The Isthmus of Costa Rica might hereafter become to the new world what the Isthmus of Suez was to the old, prior to the discovery of the route to Asia by the Cape of Good Hope. If any company succeed in cutting a canal through Costa Rica of sufficient dimensions to admit the passage of the largest vessels, and ports of free commerce be established at the mouths of this canal on the Atlantic and Pacific Oceans, there cannot be a doubt that in less than a century this isthmus would become the greatest commercial thoroughfare in the world. Let the reader cast his eye on a general map, and behold its important geographical position. Nearly central as regards the distance from the north-west coast of America and Cape Horn, and situated between two vast oceans,—the one laving the shores of Europe and Africa, and the other extending to the confines of the eastern world,—it appears to be the favoured spot, destined by nature to be the heart of the commerce of the world. It will shorten the distance to Australia, Japan, China, and our eastern territories about one-half, and reduce the time in sailing to California, Oregon, and the British settlements in the Pacific (which the dangerous journey round Cape Horn has rendered valueless), to about one-fourth. The whole of the vast regions of the eastern and western continents, whose shores are laved by the boundless Pacific, will become readily accessible to the commercial enterprise of the civilised world.

(Humboldt's *Travels in America;* W. D. Robinson's *Memoirs of the Mexican Revolution; Reports of* Dr. Cullen, Mr. Gisborne, *and others.*)

Since the preceding article was written, some difficulties of a political nature appear to have arisen. By the Clayton-Bulwer treaty, England and the United States engaged not to colonize or occupy any part of Central America, and to protect the integrity and independence of the little republics then in possession, which, it was justly supposed, would never be strong enough to dispute or interrupt the navigable passage. But difference in the interpretation of the colonization and occupation clause, led to serious complications and some acrimonious correspondence. While this was occupying the attention of the two governments, and the proposed canal remained in abeyance, an American company appeared on the field, and constructed a railway, which is actually in operation. This railway traverses the territory of New Granada; and the isthmus is there inhabited by a half-savage population, who dislike strangers, and are averse to commercial intercourse. They are virtually independent of the government, which is too weak to afford adequate protection to life and property. Contentions arose from time to time; but there was no serious outrage until the 15th of April, 1856, when a quarrel between an American passenger and a native led to a conflict, attended with loss of life and plunder of baggage. An American commissioner was sent to inquire and report to the cabinet of Washington. He accomplished his task, and presented his report, in which he exonerated his countrymen from all blame, and alleged that the assaults on the passengers were pre-

meditated. He held the government of New Granada responsible for all the consequences, and estimated the damages at 50,000 dollars. Being, at the same time, of opinion that the government of Guatemala is unable to enforce order on the isthmus, or to afford adequate protection to the traffic, he recommended that the American government should take military possession of the country from one ocean to the other.

AM'ICE (Lat. *amictus* a garment), the undermost part of a priest's habit, over which he wears the alb. Among the Romans the *amictus* was an upper garment worn over the tunica. In the Middle ages it formed the uppermost of the six garments worn by priests. The other five were the alb, manipulus, planeta, singulum, and stole. (Craig.)

AMMUNITION, in a military sense, every kind of warlike material used for the charging of fire-arms. *Fixed ammunition* comprises loaded shells, carcases, and cartridges filled with gunpowder, or with powder and ball for the convenience of loading with despatch. *Unfixed ammunition* signifies round, case, and grape shot, or bomb-shells not filled with powder. The term ammunition is also applied to the various articles served out to soldiers from the public stores; as ammunition bread, ammunition shoes, &c. (*Military Encyc.*)

AMNIOT'IC ACID (Gr. ἄμνιος the fœtus membrane) is an acid obtained from the *liquor amnii* of the cow. It is slightly acid, and reddens the tincture of turnsole. It is scarcely soluble in cold water, though it very readily melts in hot water. It may be obtained in brilliant white crystals. It unites with pure alkalies, and with them forms neutral salts, though it is incapable of decomposing the alkaline carbonates. This acid was discovered by Vauquelin and his coadjutor Buniva. In order to obtain it, nothing more is necessary than to evaporate the liquor of the amnios of the cow to one-fourth, and leave the remainder to cool, which will be found to contain the acid in crystals.

AMPELI'DÆ (Gr. ἄμπελος a vine), a family of tropical American birds, called Chatterers, or Fruit-eaters; of the order Insessores, and tribe Dentirostres. All the genera have short bills, with the lips notched, and sometimes hooked; the toes more or less united, and the soles flat. Some of the birds of this family are adorned with red and blue plumage of the most splendid character.

AMPHIPRO'RÆ (Gr. ἀμφί about, and πρῴρα a prow), a name among the classical ancients applied to vessels with a prow at each end, intended chiefly for narrow rivers, where a boat could not readily tack about.

AM'PHIPROSTYLE (Gr. ἀμφί about, πρό before, and στῦλος a column), in architecture is applied to a temple or building of Grecian structure, which has a portico of four columns in front, and as many behind.

AM'PHITRITE, a genus of tubicular annelides, or worms inhabiting tube shells, which have great beauty, and are furnished with a crown of short golden-coloured bristles. The shell is formed of sand agglumination together by the mucus of the skin.

AMPUL'LA, a globular-shaped and narrow-necked vessel of pottery or glass, used in the Roman baths, at sacrifices, &c. They are often met with in excavating the sites of Roman cities, mansions, or temples; and may be seen in the collections of almost every public museum in Europe. They were used for carrying oil, vinegar, perfumes, wine, &c. Cynic philosophers and beggars carried them at their girdles.

ANAGNOS'TES (Gr. ἀναγινώσκω to read), a literary servant, whose duty it was to read during meals in great Roman families, for the sake of amusing or instructing the guests at table. He also read to his master in private, and sometimes at night when he could not sleep. Under the Emperor Claudius these Anagnostes were in great repute.

ANAL'CIME (Gr. ἀναλκις weak), a mineral variety of zoolite, usually occurring in trap rocks, in cubic crystals, either perfect, or having each of the solid angles replaced by three planes; hence it is sometimes called *Cubisite*. It also occurs in diverging fibres forming aggregate crystals; fracture, flat, conchoidal; colour, white, grey, yellowish, reddish, or deep red; scratches glass; translucent or transparent; occasionally opaque. It becomes weakly electric when rubbed; hence the name analcime. It consists of silica, 57·07; alumina, 20·22; soda, 14·71; water, 8·28. Specific gravity, nearly 3. (Craig.)

ANAPA, a sea-port town and fortress of Circassia, on the east coast of the Black Sea, about 47 miles S.E. of Yenikale, in lat. 44° 54′ N., and long. 37° 16′ E. The population is about 3000, independently of the garrison. The inhabitants consist of Circassians, Turks, Tartars, Greeks, Jews, Armenians, Russians, &c. The port is very indifferent, and the place is chiefly important as a military post. The exports are grain, tallow, hides, wax, &c. The fortress, which attracted some attention during the late war, was first constructed by the Turks in 1784, but captured by the Russians in 1791; again in 1807; and finally in 1828; since which it has been definitively ceded to the Russians by treaty. On the forcible entrance of the British into the Sea of Azoff, in 1855, the Russian garrison suddenly abandoned Anapa, after having destroyed the forts; when the place was taken possession of by the Turks and Circassians. But since the ratification of the treaty of Paris, in 1856, the Russians and Circassians have been engaged in active hostilities; and there is every probability of Anapa again reverting to the possession of Russia.

ANASTAT'ICA (Gr. ἀνάστασις resurrection), the rose of Jericho, a plant of the natural order Cruciferæ. It was so called because, however dry, it will recover its form, if immersed in water. The flower consists of four roundish petals, in the form of a cross, and the fruit is a short bilocular pod, having in each cell a single round seed. There are two species, which are both annuals. —*Anastatica* is also the name of a species of Vorticella in the 5th order of Vermes.

ANASTAT'IC PRINTING is a term applied to a recently-discovered process, by which "designs produced either by the ordinary mode of

printing from types, copper or steel plates, wood, stone, &c., or by manual operations of writing or drawing in prepared ink or chalk, may be readily transferred to the *metal* plate, and an indefinite number of copies produced at a really trifling cost." At the first discovery of this art the world was astonished by the production of the facsimiles of entire newspapers, from which numbers of copies were produced. But the process of printing from zinc plates is so extremely slow, when compared with the amazing rapidity of steam machines now used for the printing of letter-press, that producers of newspapers need be under little apprehension of anasthtic rivalry. This announcement, however, when first made to the world, excited a general sensation, as the detection of forgery through the agency of this new art was considered as next to an impossibility; but this apprehension has in a manner passed away; for it has been found that however perfect the facsimiles, the impressions taken from the imprinted zinc plate are fainter and less distinct than those from the original prototype.—The rationale of the anastatic process of printing, like that of lithography, depends on the chemical affinity and repulsion of the materials employed, as illustrated by Professor Faraday, at the Royal Institution, in 1845. Thus water naturally attracts water, and oil, in the same way, has an affinity for oil; but each mutually repels the other. Again, metals have a stronger affinity for oil than for water, and are consequently more readily wetted by the former than the latter; but the power of wetting metals with water is increased by the addition of a little phosphalic acid. The professor, after observing that the ink of a newly-printed page can be readily transferred by pressure to any smooth surface beneath, proceeds to explain that the printed paper, whether engraving or letter-press, is first moistened with dilute acid, and then forcibly pressed, by the aid of a roller, on a clean surface of zinc, by which every part of the sheet is brought into contact with the plate. The acid with which the imprinted part of the paper is saturated etches or bites into the metal, while the printed portion sets off on the zinc; thus a reversed copy is transferred to the metal. The plate is next washed with an acid solution, and then inked. This liquid is attracted by the etched surface, which it freely wets, while it is repelled by the oil of the ink in which the print or drawing on the plate is traced. A leathern roller covered with ink is then passed over the plate, when the affinities in some instances and repulsion in the other, cause the lines of the printing to take the ink, and the white parts to reject it. In this state the anastatic process is complete, and impressions are taken from the plate by the usual lithographic process.

ANATIFA (Lat. *anas* a duck), a genus of Cirrhipeds (Barnacles), furnished with wedge-shaped multivalve shells, consisting of five or more pieces, united at the extremity, by which the animals adhere to rocks, weeds, bottoms of ships, &c. They were so named from the superstitious notion that the Anatifa lævis, or duck barnacle, was the parent of the barnacle goose. (Craig.)

ANCI'LE, a sacred shield or buckler, which was believed by the Romans to have fallen from heaven, in the time of Numa Pompilius, and on the preservation of which the safety and fate of the Roman Empire was supposed to depend. This monarch caused eleven more shields to be made of a similar pattern, in order that if any one attempted to steal the sacred shield, he would be puzzled to distinguish the true one. These twelve shields were committed to the keeping of the twelve Salii, who guarded them in the temple of Vesta, and carried them every year, upon the 1st of March, in solemn procession, singing praises to Mars, round the walls of Rome. (Adam's *Roman Antiq.*)

ANGEL'ICI, or AN'GELITES, an order of knighthood, instituted in 1191, by I. Flavius Comnenus, emperor of Constantinople. They were divided into three classes: the first, called *Torquati*, from the collar they wore; the second, *Knights of Justice;* and the third, *Knights Servitors.* They were all under the direction of a Grand Master.—The term *Angelici* was also applied to a sect of Christians which existed in the fifth century.

ANGELS, in military matters, is a term applied to two-headed bullets, or two halves of a bullet joined by a bar or chain, chiefly used for cutting cords, cables, sails, &c.; called also *chain-shot.*

ANGLESEY, HENRY WM. PAGET, MARQUIS OF, late Master-General of the Ordnance, and one of the most distinguished cavalry officers of the British service. He was the eldest son of the late Earl of Uxbridge, and was born on the 17th of May, 1768. He received the first rudiments of his education at Westminster, from whence he was removed to Christ Church, Oxford. On the breaking out of the French revolution the Marquis (then Lord Paget) entered upon his military career. In 1793 he raised the 80th regiment of foot, or Staffordshire Volunteers, chiefly on the estates of his noble father. He was then presented with a lieutenant-colonelcy in the army. In 1794 he embarked with his regiment for service under the Duke of York, in Flanders. He was there removed from the 80th regiment to the command of the 7th regiment of light dragoons, and accompanied his Royal Highness in the expedition to Holland, in which he greatly distinguished himself by his military skill and intrepidity. After the return of the army from Holland, in 1800, Lord Paget devoted himself most assiduously to his regimental duties; and by his unremitting attention the 7th light dragoons became one of the first regiments of cavalry in the British service. Having received the military rank of lieut.-general, he was appointed to the command of two brigades of cavalry, consisting of the 7th, 10th, 15th, and 18th regiments of hussars; and in 1808 he was ordered to join the division sent under the command of Sir David Baird to co-operate with Sir John Moore in Spain. At the period of Lord Paget's junction with the British forces the critical state of affairs had determined Sir John Moore to fall back upon Portugal; but, on his being able to effect a junction with Sir

David Baird, this intention was suspended, and General Paget was stationed with his division of cavalry near Sahagun, where he surprised a picquet of the enemy, and soon afterwards made a successful charge upon their united forces. The rapidity with which the British cavalry rushed on to the attack could not be withstood; the enemy's line was immediately broken, and their whole force dispersed with considerable slaughter. Two lieut.-colonels and 190 men were made prisoners. In the disastrous retreat of Sir John Moore, Lord Paget, with his cavalry, brought up the rear, and the ardour of his lordship frequently exposed him to imminent danger. Severe skirmishing daily took place; but the masterly dispositions of his lordship enabled the British troops to reach Corunna with a trifling loss. At Benevento Lord Paget's division was attacked by a strong body of the chasseurs of the imperial guard; but it was met with so much gallantry that they were entirely overthrown, with a loss to the enemy of a general and several other officers, 100 men made prisoners, and many killed, wounded, and drowned. Thus, by a continual series of bold operations, Lord Paget acquired for the British cavalry the high character they held during the rest of that disastrous campaign. On the death of his father, in 1812, Lord Paget succeeded to the title of Earl of Uxbridge. He did not share, to any great extent, in the subsequent operations in the Peninsula; but when the British army was assembled in the Netherlands, to repel the advance of Napoleon upon Brussels, Lord Uxbridge greatly distinguished himself at the head of the British cavalry in several brilliant charges, and especially in the final one at Waterloo, when his lordship received a wound, from almost the last shot that was fired, in the joint of his right knee, which rendered amputation necessary. For his long and important services the Earl of Uxbridge, in 1815, was raised to the dignity of Marquis of Anglesey; and after the general peace, which soon followed the battle of Waterloo, he held the post of Master-General of the Ordnance, and various other important offices connected with the military service of his country. He died, in 1854, at the advanced age of 86.

ANGLESEY, Island of, in Wales (i. 736-8). According to the census of 1851, the population of this island was 57,327; and that of the principal places was as follows:—

Amlwch .....pa.	5,813
—— .....bor.	3,169
Beaumaris	2,465
Holyhead.....pa.	8,863
—— .....bor.	5,622
Llangefni	1,799

ANGOULÊME, LOUIS ANTOINE DUC D', was the elder of the two sons of Charles Philippe Count d'Artois, afterwards Charles X., by Maria Theresa, daughter of Victor III., King of Sardinia. He was born on the 6th of August, 1775, and after having long been exposed to the adverse fortunes of the house of Bourbon, he was married to the princess royal of France, the only daughter of the unfortunate Louis XVI., on the 10th of June, 1799. On the accession of the Bourbons to the throne of France, in 1814, he assumed a conspicuous position as the heir presumptive to the throne. In 1823 he was placed at the head of the French armies that invaded Spain, for the purpose of putting down the new constitution, and restoring Ferdinand to absolute power. His objects were fully accomplished; but his march through the country, from the Pyrenees to Cadiz, was more like a military parade than a campaign; for nowhere did he meet with the least effectual opposition; yet his exploits were the subjects both of the French painters and sculptors of that period. On the overthrow of his father, Charles X., in 1830, the Duke resigned his right of succession in favour of his young nephew, the Duc de Bourdeaux, whose father, the Duc de Berri, was assassinated in 1820. The Duc d'Angoulême appears to have been a man of no firmness or decision of character; for at the revolution of 1830 he was content with doing nothing; and during the exile of his house he was satisfied with being nothing; though in private life he seems to have been an amiable man. When he perceived his end approaching, he sent to the archives of the war department at Paris an important work, which he had caused to be executed during the Restoration, containing plans, drawings, and full descriptions of all the fortified places in France, and showing their weak points, and the best means of defending them. He died on the 3rd of June, 1844, at Goritz, in Austria, from a cancer in the pylorus. He was interred in the chapel of the Franciscan convent, in the same vault where rest the mortal remains of Charles X.

ANGUI'NA (Lat. *anguis* a snake), a family of Ophidian reptiles, with small teeth, nearly of equal length; tongue with a luniform notch; ribs united in a greater or smaller degree, so as to supply the place of a sternum, or breast-bone; eyes provided with three eyelids. (Craig.)

ANHY'DRITE (Gr. α and ὕδωρ without water), a variety of the sulphate of lime, harder than selenite, and occasionally containing chloride of sodium, when it is called muriacite; colours, white, blue, red, and grey; massive and crystallized; lustre, pearly; fracture, splintery and conchoidal; specific gravity, 2·85.

ANIMAL HEAT, a term applied to the natural temperature of animals. The animal temperature in man, and other mammiferous animals, when in perfect *health*, is from 94 to 100 degrees Fahrenheit. The heat of the animal system is chiefly owing to the production of carbonic acid, by the union of oxygen with the carbon of the blood in the process of respiration and circulation.

ANNA'TES, the first fruits of a benefice, were first imposed in England by Clement V. in 1366, and in France by his successor John XXII. Matthew Paris, in his History of England for the year 746, states that the archbishop of Canterbury, by virtue of a grant of the Pope, received annates of all the benefices that became vacant in England. Afterwards the Holy See thought fit to take them away from the bishops and archbishops, and appropriate them to its own benefit. The Parliament, however, under Henry VIII.

took them from the Pope, and gave them to the Crown. This mode of taxing the clergy, however, was subsequently evaded, by means of a valuation made in 1525, which is contained in what is denominated the "Liber Regis."

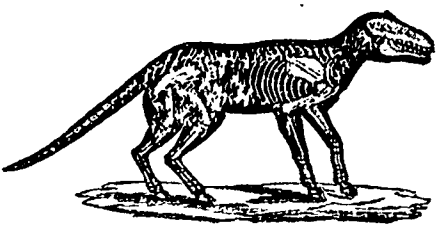
ANNIVERSARY DAYS, or *Dies Anniversarii*, were solemn days among our ancestors, appointed to be celebrated yearly in commemoration of the deaths or martyrdom of particular saints; or the days whereon, at the return of every year, men were in the habit of praying for the souls of their deceased relatives or friends, according to the custom of the Roman Catholics. Alcuinus, in his "Divine Offices," says, "Anniversarios dies ideo repetitur defunctis, quoniam nescimus qualiter eorum causa habeatur in aliâ vitâ."

ANNULA'TA (Lat. *annulus* a little ring) is a name given by Cuvier to the first class of his third grand division of the animal kingdom, the Articulata. The nervous system of the Annulata consists of a double-knotted cord, like that of the Insecta; but they are the only invertebrated animals that have red blood, which circulates in a system of complicated vessels. The body is soft, more or less elongated, and divided into a considerable number of segments, or, at least, of transverse plaits or folds. With the exception of the Lumbrici, or earth-worms, the Annulata are nearly all aquatic. Some of them construct tubes, with the ooze or other matters, into which they burrow, or exude calcareous tubular shells, in which they exist.

ANNUNCIATION (Lat. *annuncio* to announce) is the name given to the day celebrated by certain churches, in commemoration of the angel's salutation of the Virgin Mary: this day is the 25th of March.

ANO'MIA (Gr. *ἀ* and *νόμος* without any rule), in natural history, one of the acephalous testacea belonging to the Ostracea or oyster family. The shell consists of two thin valves, the under one flattened, and the greater part of the central muscle of the fish passes through a marginal notch or hole near the umbo of the shell. This muscle is inserted in a third piece, of a calcareous nature, by which the shell adheres to extraneous bodies.

ANOPLOTHE'RIUM. This curious but extinct race of animals, which is almost peculiar to the gypsum quarries of Paris, has been already noticed as belonging to the pachydermatous genus (i. 787); and in some respects it may be classed between the hog, the rhinoceros, and the horse. Of late years our naturalists have been able to reconstruct, from the fossil bones found in the tertiary formation of Paris, a complete menagerie of extinct organized beings; and the annexed is a striking representation of Cuvier's *Anoplotherium commune*, the skeleton of which was thence obtained, as it appears in Ansted's "Geology." This animal is clearly of the pachydermatous kind, of which five species (says Cuvier) have already been recognised; one the size of a small ass, with the low form and long tail of an otter; another of the size and slender form of the gazelle; and a third no bigger than, and with nearly the same proportions as a horse.



THE ANOPLOTHERIUM OF CUVIER.

ANTEJURAMEN'TUM, a solemn form of oath among our ancestors, which both the accuser and the accused were obliged to make before any trial or purgation. By this form of oath the accuser was to swear that he would prosecute the criminal, and the latter was to make oath that he was innocent of the charge preferred against him. If the accuser failed, the criminal was discharged; and if the accused failed, he was at once condemned, without being allowed the privilege of ordeal, or trial by combat.

ANTES'TATURE (Lat. *ante* before, and *stare* to stand), in military fortification a small entrenchment, consisting of palisadoes or sacks of earth hastily thrown up as a defence, and for the purpose of disputing the rest of the ground, when the enemy has gained possession of a part of it.

ANTHESTE'RIA, festivals celebrated by the classical ancients in honour of the god of wine. They received their name from *Anthesterium*, the name of the month in which they were celebrated. They were of three days' continuance. During that period the slaves were permitted their full liberty and right of enjoyment, in the same manner as at the Roman Saturnalia. Being a sort of Bacchanalian festival, it was the custom to reward the best drinker with a cask of wine and a crown of gold.

ANTHOPH'ILA (Gr. *ἄνθος* a flower, and *φίλω* to love), a name given by Lamarck, Latreille, and others, to those insects which live by sucking honey from flowers. It is a name applied to the bee family, and, according to Cuvier's system, it forms the fourth family of the Hymenoptera.

ANTIBURGH'ERS, a sect of Presbyterian seceders in Scotland, who differ from the Burghers, with whom they were originally united, respecting the lawfulness of the Burgess oath. They are rigid Calvinists, and assume an austerity of manners and severity of discipline. A re-union, however, has lately taken place between the Burghers and the greater portion of the Antiburghers; and these two sects form what is now called the United Secession Church of Scotland.

ANTI-CORN-LAW LEAGUE. This association was first formed at Manchester in September, 1838. At a public dinner given to Dr. Bowring, on the 18th of that month, the company present on the occasion, consisting of about sixty persons, formed themselves into an association for the promotion of free trade. This was the germ of the Anti-Corn-Law League. The society rapidly increased in numbers, and in 1839 an Anti-Corn-Law Convention assembled in the me-

tropolis. Meetings were held at different parts of the kingdom, and lecturers were appointed to address the populace, with the view of gaining adherents to the cause. In 1842, a bazaar was held at Manchester, at which 10,000*l.* were realised for the benefit of the society. In 1843, the monster meetings in Drury Lane and afterwards in Covent Garden Theatres were commenced; and in 1845, a bazaar was held at the last-mentioned establishment. The repeal of the corn laws having been effected, the league was dissolved on the 2nd of July, 1846. Mr. Wilson, the chairman, received 10,000*l.*, and Mr. Cobden upwards of 70,000*l.*, for their exertions in the cause. On the accession of Lord Derby's government to office, in 1852, an attempt was made to revive the league, and a subscription list was opened; but after a little bustle and agitation it all fell to the ground.

ANTI-PÆDOBAP'TISTS (Gr. *ἀντί* against, *παιδίον* an infant, and *βάπτω* to baptize), a very numerous and respectable sect of dissenters in England and America, who deny that infants ought to be baptized. They are now generally called Baptists.

ANTI-SABBATA'RIANS, a sect of Christian dissenters, who maintain that, as far as piety is concerned, every day of the week should be held alike; and that the observance of days entirely devoted to the purposes of religion terminated with the abolition of the Jewish Sabbath. They ground their doctrines more especially on Paul's warning the Galatians against the observance of Sabbath-days, and on there being no especial injunction in the New Testament for the religious observance of the first day of the week, beyond the example of the disciples meeting on that day to celebrate the Lord's Supper.

ANTRIM, County of, in Ireland (i. 867-9). According to the census of 1851, the population of the entire county was 352,264; and the number of registered electors 1314. The amount of property valued for the poor-rate was 675,208*l.*, and of landed property 479,934*l.* The population of the principal places was as follows:—

Antrim	pa.	5,182
——	t.	2,645
Belfast		100,300
Ballymena		6,493
Ballymoney	pa.	10,322
——	t.	2,578
Carrickfergus	bor.	8,520
——	t.	3,543
Larne		3,422
Lisburn		6,932

ANU'BIS, an Egyptian deity, the son of Osiris, frequently represented, on the ancient sculptures of Egypt, as a human figure with the head of a dog or fox. He is considered, like Charon of the Greeks, as the conductor of departed spirits, and is represented, in some of the Egyptian pictures, as standing at the side of a bier, on which a mummy is lying.

APHANIP'TERA (*ἀφανὴς* obscure, and *πτερὰ* wings), in entomology, an order of insects, of which the common fly is the type. The female deposits twelve eggs, from which small maggots are produced, which, after twelve days, spin themselves into small cocoons, whence the flies emerge in a full-grown state.

APHID'II (Gr. *ἄφις* a plant-louse), a family of hymenopterous insects, generally known as wood-lice, which are furnished with two elytra and two wings. Their antennæ consist of ten or eleven joints, the last of which is terminated by two setæ.—*Aphidiphagi* are a family of coleopterous insects which live on the aphides.

APH'ORISMS, NATIONAL (i. 892). As conversation is the mirror of thought, so the aphorisms of a people may be considered the medium which reflects, with tolerable accuracy, the existing state of their manners and modes of thinking. In truth, there must be a close connection between the popular aphorisms and the manners of a nation. They have, as it were, a reciprocal influence on each other,—the sentiments and mottoes of one generation giving birth to certain maxims, which contribute, in their turn, to influence and mould the manners of the next. Thus have they been considered of such utility and importance in the conduct of life as to have made it the study of the moralist, in every country, to inculcate them with the greatest effect, by clothing them in such forcible and striking language, and condensing them in so laconic a form, as might best allure the attention, and enable the memory most easily to retain them.

The maxims of a people may be classed under three different denominations, viz. TRUISMS, APHORISMS, and PROVERBS. A truism is an acknowledged dictum or saying, of which there can be no reasonable doubt, as "Man is mortal." An aphorism is a maxim or choice sentence comprehending much matter in a few words, and calculated to convey some interesting truth or moral principle in a concise and impressive form; as, "When imposture reigns, simple truth is sedition." A proverb is an old adage or popular saying, which usually conveys a meaning somewhat different from the general sense of the words, and often imparts some useful caveat; as, "A close mouth catches no flies." Common proverbs may be said to constitute the moral code of the vulgar; and often form their popular and traditional wisdom. The more refined proverbs of a nation, however, are purely of an aphoristic character; as, "A soft answer turneth away wrath" (Prov. xv.). Indeed in many instances the terms aphorism and proverb may be indiscriminately applied to the same sentiment; as, "The goose-quill is more dangerous than a lion's paw."

From the antiquity of aphorisms and proverbs may be defined the primitive language of mankind, in which knowledge was preserved prior to the invention of letters. The process of argumentation becomes necessary only when the diffusion of knowledge and the existence of conflicting opinions weaken the force of authorities, and make it incumbent on the professor to demonstrate the truth of everything he advances. Thus it is that in the maxims of the Eastern Magi and Sages —in the learning of the Chinese and Hindoos—in the verses of the poets—in the classic historians of Greece and Rome—in the sayings of philo-

sophers, ethicians, and statesmen—in the writings of the ancient fathers and schoolmen, and in those of later date—we often detect the germ of those ancient thoughts which now circulate under the humble guise of an old saying. Hence it is that from the aphorisms of a people we may learn the chief peculiarities of their national and moral condition; and not only "their wit, spirit, and intelligence" (as Lord Bacon observes), but their customs and domestic avocations. The moral maxims of China (for instance) bear a strong resemblance to those of Greece and Rome. "Without the wisdom of the learned" (say they) "the clown could not be governed; without the labour of the clown the learned could not be fed." In the same strain, Cicero says, "Wise men are instructed by reason; men of less understanding by experience; the most ignorant by necessity; and brutes by nature."

It is supposed that among the European nations of modern times there are no less than 20,000 aphorisms, many of them borrowed from the ancients, chiefly Greek, who themselves have borrowed them largely from the Eastern world. These aphorisms appear to be characteristic of each nation. Thus the Spanish are celebrated for their pith and humour, and are characteristic of the age of Cervantes and Gil Blas; as, "A friar who asks alms for God's sake asks for two." The aphorisms of the Italians are generally of the nature of philosophical or refined political axioms; as, "Who serves at court dies on straw." The French aphorisms are perhaps more varied than those of any other nation; and are chiefly of a political or ethical character, as "When imposture reigns simple truth is sedition."

England presents an inexhaustible mine of proverbial lore, in which we may trace the genius of the people. Her aphorisms are chiefly reflected in the writings of Shakspeare, as well as in the early dramatists, Beaumont, Fletcher, Jonson, and others. Of English aphorisms Shakspeare is justly esteemed the pride and ornament; and it forms a matter of deep consideration whether their frequent coincidence of sentiment with those of the ancient philosophers and poets was the result of deep reading and study, by which his mind became early imbued with the noblest sentiments of classical antiquity; or whether these coincidences arose from the circumstance that, among the greatest geniuses of all ages, the same ideas may be clothed with the same sentiments, and adorned with similar language. It is certain that many of the aphorisms of Shakspeare present a wonderful coincidence with those which the ancients have transmitted to us; and which are still preserved in the national writings of the moderns. Thus on the subject of "MIND," Cicero says, "The grace of man is in the mind;" and Shakspeare expresses the same idea in similar language: "It is the mind that makes the body rich." We have in Sirach, "The heart of a fool is in his mouth;" and Shakspeare says, "A fool's bolt is soon shot." The Chinese have a common aphorism, to the effect that, "The evil deeds of men will not die with them; but the fame of their good actions seldom goes beyond their own doors." In the tragedy of Julius Cæsar we have the same sentiment;—

"The evil that men do lives after them;—
The good is oft interred with their bones."

On the whole we may safely conclude, that there are certain truths constantly operating in the world, as unchangeable as the principles of nature. Time and space have no effect upon them. They are alike palpable in all ages, and are the same now as they were at the beginning, and will be to the end of time. These universal and intuitive perceptions are comprised in the APHORISMS OF NATIONS, which we find, amongst every people, inculcating similar notions of justice, and of the moral duties of friendship and of love. The progress of knowledge, local situation, and institutions, may refine or modify them: but, substantially, they are the same truths, whether circulated in familiar aphorisms among the people, or delivered from the university chair, disguised in the subtleties of a Hume or a Reid, or clothed in the more popular language of a Paley, an Addison, or a Johnson.

APHRODIS'IA (Gr. Ἀφροδίσια Venus), in classical history a general name given to the various festivals held in honour of Venus; the most celebrated of which were held at Cyprus, where several mysterious rites were performed. All who were initiated offered a piece of money to the goddess as a harlot, and received in return a measure of salt, and a phallos; the salt because Venus was born of the sea, and the phallos, because she was the goddess of wantonness.

APOCRIS'IARY (Gr. ἀπόκρισις an answer), in the lower empire of the Romans, a name given to the especial messenger of an emperor or prince. By degrees this officer was raised to the dignity of chancellor or secretary of the emperor, and kept the state seal. The title at length became appropriated, as it were, to the Pope's deputy or agent, who resided at Constantinople, to receive the orders of his holiness, and the emperor's answer; his duties being somewhat similar to those of the pope's nuncio of modern times.

APODYTE'RIUM (Gr. ἀποδύω to undress), was a kind of ante-chamber, or undressing-room at the entrance of the ancient Roman baths. It was also the place where the wrestlers in the Palæstra dressed and undressed, when preparing for contest in the public games. The term is still used at Oxford for the room before the entrance of the Convocation House, where the chancellor, proctors, and others, robe and unrobe.

APOLLINA'RIAN GAMES were annually celebrated at Rome, on the 5th of July, in honour of Apollo. They originated from a traditionary story that the city had been formerly saved by the intervention of Apollo (Livy, xxv. c. 12). At their representation the people generally sat crowned with laurel; and the prætor had the direction of them. The games were originally fixed at the prætor's discretion; but in the year 545 U.C., a law was passed to settle them for ever on a constant day.

APOLLINA'RIANS, a sect of religionists of the fourth century, who were the followers of Apollinaris, bishop of Laodicea. He taught many

strange doctrines respecting the body and divinity of Christ, which overspread most of the churches of the east; but they were condemned by a synod of Alexandria, under St. Athanasius, in the year 362.

APOLLO, TEMPLE OF. Amongst the ancient oracles, that delivered by Pythia, in the temple of Apollo, at Delphi, was the most celebrated. The replies were supposed by the people to be inspired. This magnificent structure was built 1263 B.C., and was destroyed by fire, after having stood seven centuries. Another temple was raised upon its site, but it never attained the celebrity of the original building.

APOSTLES' CREED. The use of this creed was adopted by the English church at the period of the Reformation. Although it bears the name of the apostles, it was not drawn up till a much later era than that in which they flourished. In support of each article, a text from their writings might be quoted, as may be seen in that valuable little book entitled 'The Liturgy compared with the Bible;' and it is thus very appropriately named the Apostles' Creed.

APPROPRIATIONS were first introduced into this country in the time of William the Conqueror. The term, as understood in church history, means the applying of an ecclesiastical benefice to the proper and perpetual use of some religious community; and, on the contrary, the confiscations of such benefices to lay purposes, as in the time of Henry VIII., are termed *lay impropriations*. When these appropriations were first introduced, the parochial clergy were usually Saxons; and the bishops and secular clergy being Normans, they made no scruple at impoverishing the inferior priesthood, in order to enrich the monasteries, which were generally possessed by the Conqueror's friends. In all cases, where the churches and tithes were so appropriated, the *vicar*, or officiating substitute, only received as much for the performance of his duties as the bishop or superior thought proper to allow. To such an abuse was this system at last carried, that Pope Alexander IV. complained of it as the bane of religion, the destruction of the church, and as a poison that had infected the whole nation. Thus appropriations (says Kennet) have been generally considered an abuse and robbery of the church and parish priests.

APPROPRIATION CLAUSE IN THE IRISH TITHE BILL. The history of this clause is important. Previous to the accession of the Wellington and Peel cabinet to office in 1834, several attempts had been made to settle this long-agitated question. Early in the session of 1835, Lord John Russell moved that the House should resolve itself into a committee to consider the temporalities of the Church of Ireland, and having carried this against the ministers by a majority of 33, he immediately brought forward his resolution: "That it is the opinion of this committee that any surplus which may remain, after fully providing for the spiritual instruction of the members of the Established Church in Ireland, ought to be applied to the general education of all classes of Christians." This resolution was carried on the 6th of April, by a majority of 25 votes. On the bringing up of the report on the 7th of April, Lord John Russell moved: "That it is the opinion of this house that no measure upon the subject of tithes in Ireland can lead to a satisfactory and final adjustment, which does not embody the principle contained in the foregoing resolution;" and to this he obtained a majority of 27 votes. Thereupon the Wellington and Peel cabinet resigned, and Lord John Russell came into office. After several ineffectual attempts to induce the House of Lords to assent to the appropriation principle, this statesman, in 1838, consented to sacrifice it altogether. This paved the way for the fall of the Whig cabinet, and in 1841 Sir Robert Peel succeeded to power.

APSIS, or ABSIS, in ecclesiastical architecture, that part of an ancient church where the altar was placed, and the clergy were seated. It was of a semicircular figure; and consisted of two parts, the choir and the sanctuary, as sometimes in the present day. The choir had seats or stalls around it, wherein the officiating priests were disposed. In the middle or furthest seat was the bishop's throne. The sanctuary was at the opposite end next the nave, from which it was separated by a grate. In the middle of this was the altar, erected on a pulpitum, and over the altar was a ciborium, or cup, serving as a canopy. The portion of a church before the apsis was reserved for the more important services of religion. *Apsis* was also a reliquary, or case, where the relics of saints were preserved, and was usually deposited on the altar. (*Du Cange*).

AP'TERA (Gr. ἀ and πτερὰ, without wings), a very extensive order of insects, forming the seventh in the system of Linnæus, and the twelfth in that of Kirby. As the name implies, they are without wings, and their powers of locomotion are confined to creeping or jumping; as in the bug, louse, flea, &c. In the last system published by Latreille, the term, though extremely appropriate, is altogether rejected.

AQUA'RIANS, a Christian sect of the third century, who were so called because they abstained from wine even in the sacraments, and drank nothing but water. Tatian is said to have been the founder of this sect, and the reason for their abstinence was the persecution to which they were subject, when they were obliged to meet in secret, and use water only in the sacrament, for fear that the presence of wine should lead to detection.

AQUA'RIUM. This word is a contraction for Aqua-Vivarium, signifying a place where aquatic animals are kept alive.

There are two kinds of Aquaria, according to the nature of the water used in them. Marine aquaria contain sea-water, and are intended for the preservation of marine animals, while fresh-water aquaria accommodate lacustrine and fluviatile creatures.

The theory of the aquarium is simple enough. It is known that all animals are constantly giving out carbonic acid gas, and consuming oxygen; so that if a number of men are shut up in a confined space (as in the Black Hole of Calcutta), or

a number of aquatic animals placed in a limited amount of water, they soon perish; being, in fact, poisoned by the carbonic acid gas. But it is also well known that vegetable life exists on precisely different principles, viz. that it inhales carbonic acid gas, and exhales oxygen. So that if animal and vegetable life are placed together, and properly balanced, the vegetables take to themselves the carbonic acid given out by the animals; at the same time giving out sufficient oxygen to create the blood of the animals. Therefore, if an excess of vegetable life is preserved, the water is kept in a fit state to support both vegetable and animal life. It is, in fact, a microcosm.

The material of which the aquarium is composed is usually glass, slate, and metal. If the shape is that of a square or rather oblong vessel, it is usually made with a slate bottom and glass sides, the whole being kept together with a framework of metal and glass firmly fixed by cement. It is very important that the various parts should be fitted with care, and that the water should nowhere be in contact with the metal; for if sea-water is used, the salts held in solution would attack the metal, and seriously injure the health of the inhabitants by forming noxious compounds, besides risking the stability of the framework. Wood is treacherous for the framework; and although it will answer admirably for a time, yet, as the tank is intended to last for years, something more capable of resistance must be employed.

The writer does not recommend great width, as the refractive power of water is very great, and an object that is viewed at the distance of a foot or so, suffers great distortion of form. Consequently an equal volume of water may be contained in the vessel, by increasing its length at the expense of its width. A foot or fourteen inches is quite wide enough. The sides should be made of plate glass if possible, both on account of its strength, and its freedom from those flaws which are found in every other kind of sheet glass.

If it is of any great size, that is to say, more than three feet in length, the *ends* may as well be formed of slate, and only the sides of glass.

On an emergency, any vessel of sufficient capacity will answer as an aquarium. The writer made use of a common earthenware foot-pan as an extempore aquarium, until the proper tank could be settled, and did not lose any of the inhabitants. It is necessary, if a tank be used, that it should be kept for a considerable time before any animals or plants are placed in it. Three weeks dry and three full of fresh water will usually season it; the first to harden the cement, and the second to soak out noxious matters that exude from the joints. The water should be changed several times, and if any iridescent spots appear on the surface, the vessel is unfit for use.

A simple glass vase forms a very good aquarium, only subject to one disadvantage—viz. the great distortion of the image from the form of the vase. Otherwise a vase is far superior to a tank, as no cement or metal is required, and the consequent dangers are avoided.

The fresh-water aquarium is the easier of the two to manage, and much the cheaper; for a cask of sea water costs very nearly as much as a cask of good beer. In the fresh-water aquaria such plants as Vallisneria, or any of the common small river weeds, will supply oxygen, while the animals may consist of various fish (which should not be large), any of the fresh-water shells, various water insects, newts, &c. Little eels will live well in a tank, and look most graceful. Such fish as minnows, carp, gudgeon, loach, &c. are hardy enough, while one or two sticklebacks may be introduced. They are very hardy, but very quarrelsome, and are dangerous neighbours.

The marine aquarium must be filled with sea water, either real or artificial. The writer does not recommend the latter, whose only advantage is, its freedom from putrefying animal matter, which is often suspended in the real sea water. But a charcoal filter will obviate all bad consequences.

The plants necessary to keep up the supply of oxygen are the Chlorosperm Algæ, such as Ulva latissima (perhaps the very best for the purpose, and very common), Enteromorpha compressa, Cladophora rupestris, &c. Porphyra vulgaris is a very useful plant, and pours out oxygen abundantly. Next in value, and more than equal in beauty, are the Rhodosperms, of which Delesseria sanguinea is the queen. Iridæa edulis is also useful. Others may be added at discretion; but the Melanosperm, such as the common Bladder wrack, the Laminaria, &c., must be avoided, for they damage the water.

Before placing any animal in the aquarium, it should be tenanted for a week or ten days solely by the sea weeds and sea water. By that time everything will have settled, and the water be in a proper state to receive animal life. Otherwise most of the animals introduced will die in twenty-four hours. In case of a deficiency of oxygen, the water may be renewed by dipping a glass into it, and pouring the water back again from some height. This will drive atmospheric air into the water, which will then absorb sufficient oxygen to restore it to its normal state.

The bottom of the aquarium should be filled up with sand, pebbles, and pieces of rock, so as to imitate the bottom of the sea as closely as possible.

Almost any marine creature may be placed in an aquarium, and will live, if carefully attended to. As to fish, the little gobies, small flat fish, the marine stickleback, the pipe fish, will answer very well. For crustacea, the hermit crabs, the spider crabs, various shrimps and prawns will make themselves at home. Many other crustacea will be found hidden in the sea weed, and will come out in due time. Any actiniæ will answer, except, perhaps, Bunodes crassicornis, which is very capricious, and generally prefers death to captivity, besides giving out a very unpleasant kind of slime. Some trochi and periwinkles will be wanted to clear off the confervoid growth that in a short time dims the glass.

Anything, however, that dies must be *instantly* removed, or the water becomes tainted, and the animals perish; so that the labour of many months

may be annulled by the neglect of a single day. The principal secret in an aquarium is constant attention.

ARAGO, DOMINIQUE FRANÇOIS JEAN, a distinguished French astronomer, the Director of the Royal Observatory of France, and Perpetual Secretary of the Academy of Sciences. He was born in the village of Estagel, near Perpignan in the Pyrennees, on the 26th of February, 1786. Like the majority of most distinguished men he was the architect of his own fortune. When a youth in the college of Perpignan his ambition was first excited by the high feelings of respect paid to the talents of an engineer-en-chef. He learned that he had a chance of obtaining the same honours by means of the Polytechnic School, and that a searching examination in mathematics must be encountered before he could be admitted into that institution. Hence he was induced to devote the youthful energies of his mind to mathematical studies; and in 1804 he was enabled to enter that institution with the highest honours. So conspicuously did he there distinguish himself, that in 1806, when only twenty years of age, he was appointed Secretary of the Board of Longitude, and selected as an assistant to Biot, for undertaking the measurement of an arc of the meridian in Spain. On the death of the great astronomer, Lalande, he was elected a member of the Institute of France, in the astronomical section, at the age of twenty-three. He was soon afterwards appointed Professor of Analysis, Geodesy, and Social Arithmetic to the Polytechnic School. He then devoted himself to various subjects of science, and was the author of more than sixty distinct memoirs on its various branches. Among his more important astronomical essays were those on the Comets of Short Period,—on Chronometers, —on the Double Stars,—and on the long-disputed question,—Does the Moon exercise any appreciable Influence on our Atmosphere? He also wrote on Nocturnal Radiation,— on the Theory of the Formation of Dew, and other subjects of a meteorological character. His treatises on the Steam-engine, on the Voltaic Pile, on the phenomena of Magnetic Rotation, on the Polarization of Light, and other kindred subjects, have tended to immortalize his name; although the French nation, in their eagerness to do him honour, have claimed for their philosopher discoveries to which his title may be justly disputed.

In 1806, Arago established, in connection with Gay-Lussac, the 'Annales de Physique et de Chimie,' for the purpose of giving immediate publicity to all the discoveries of science. In 1830 he was raised to the important office of Director of the Observatory, and succeeded Fourier as a perpetual Secretary of the Academy of Sciences; in which offices he distinguished himself for unwearying industry, and the most remarkable assiduity of mind.

In politics, Arago was a consistent philosophical republican, as evidenced by his numerous letters on different subjects of social polity. As a deputy he delivered a great number of speeches to the Chamber, which were distinguished for the clearness of his views, and the liberality of his sentiments. On the breaking out of the French revolution, in 1848, which drove Louis Philippe from the throne, Arago was elected a member of the Council General of the Seine. He was also named a member of the Provisional Government, and Minister of War and Marine ad interim. But all his efforts to stem the revolutionary torrent were unavailing; and the result put an end to his political career. Rather than sacrifice his principles, he refused to take the oaths of office to serve under Louis Napoleon, and resolved to quit the Observatory. But the result was remarkable. In dispossessing the political recusant of office, the government made an honourable exception in Arago's favour; and at the time of his death, which took place on the 2nd of October, 1853, he still held the public offices which he had so long adorned, with credit to himself, and advantage to the civilised world.

Arago had been elected a member of nearly all the scientific societies in Europe. In every part of the civilised world his name was held in the deepest reverence; and all scientific communities felt that they had lost a friend, when they heard of his death. In the history of philosophy his name will retain an enduring fame; not so much, perhaps, from the discoveries he made, as from the important aid which he imparted to science, in all its departments, by his unwearying researches and unfailing penetration.

ARAGOA'CEÆ (so called in honour of *Arago*, the French astronomer), a natural order of exogenous plants of the class Corolliflorœ, and confined to the single genus *Arago*. They are natives of the mountains of Santa Fé de Bogota, in New Granada, and present a family of very beautiful and curious shrubs. The leaves and flowers are small; the former being coriaceous and imbricated, and the latter salver-shaped, white, and nearly sessile.

ARANEI'DANS (Lat. *aranea* a spider, and Gr. *εἶδος* like), in natural history the scientific name of a large family of the class Arachnides, which comprehends the various genera of spiders. The characteristics and habits of these insects are familiar to most persons. Their mouths are furnished with short horny jaws; with two feelers incurved and jointed; they have six and sometimes eight eyes, and eight feet; and the arms are furnished with four or six spinnarets. They fix the ends of their threads by applying their spinning papillæ to any substance, and the thread lengthens as the animal recedes from it. They are enabled to stop the issue of the thread by contracting the papillæ; and by means of their claws they can re-ascend it with the greatest rapidity.

AR'BALET, a steel cross-bow, in general use, as a military weapon, among our mediæval ancestors. It was set in a shaft of wood, with a string and trigger, bent with a piece of iron fitted for the purpose; and used for throwing bullets, darts, large arrows, &c.

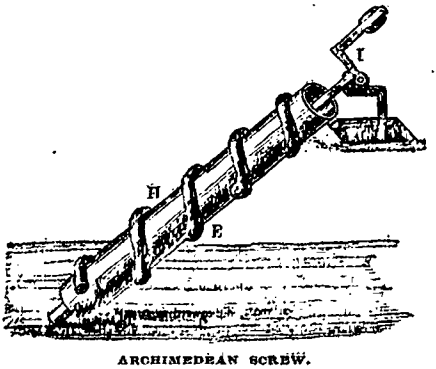
ARBOR DIANÆ (Lat. the tree of Diana), in chemistry, the name given to a beautiful arborescent appearance which takes place in a vessel containing a solution of the nitrate of silver, when

mercury is thrown into it. This appearance has also been called the *arbor mineralis philosophica*. In making the experiment, 20 gr. of lunar caustic to six or eight drachms of water are in very good proportion. This appearance of metallic vegetation, as it may be called, by which we see a shrub rising up in a bottle, and even throwing out branches, is one of the most curious spectacles exhibited by chemistry. Different terms have been applied to the different kinds of arborescence. Thus the *Arbor Martis* (tree of Mars) is produced by dissolving iron filings in aquafortis, until the acid is saturated, and then pouring gradually into the liquid a solution of fixed alkali, commonly called 'oil of tartan per deliquium,' when a strong effervescence takes place, and the iron, instead of falling to the bottom of the vessel, will often rise so as to cover its sides; thus forming a multitude of ramifications heaped one upon the other, which will sometimes pass over the edge of the vessel, and extend themselves on the outside with all the appearance of vegetable florescence.

Arbor Saturni (the tree of Saturn) is another kind of arborescent arrangement, which is obtained by dissolving one part of the protoxide of lead in 24 of water, and suspending a piece of zinc in the solution by thread or any pensile filament.

ARCHANGELICA (ἀρχὴ original, and ἀγγέλικα angelic), a genus of umbelliferous plants, growing very abundantly in marshes, among reeds, in many parts of England, and especially between Woolwich and Plumstead. The *Angelica archangelica* of Linnæus is a well-known garden herb, the leaves of which are sometimes blanched and eaten as celery, or candied with sugar.

ARCHIMEDEAN SCREW (so called from Archimedes the inventor), a machine in general use among the ancients for raising water from any given depth or to any certain height. It chiefly consisted of a tube rolled in a spiral form round a cylinder, a modification of which has lately been brought into use, as a successful substitute for paddles in propelling steam-vessels (as described below). By means of this machine, the ancients were in the habit of raising water to considerable heights for the supply of reservoirs, also for emptying the holds of ships and other useful purposes. The engine, as already mentioned, consisted of a long cylinder, with a pipe-tube, or hollow band, coiled around, as represented in the annexed figure.



ARCHIMEDEAN SCREW.

This cylinder is placed in an oblique position, at an angle of about 45 degrees, with the lower end in the water; the other end being supported on the lower part of the winch I, by which the screw and cylinder are turned round. When the cylinder begins to revolve, the water immediately rises therein by the orifice C, to the level of the surface of the water, E; and if the point of the spiral curve, which at the commencement of the motion is coincident with the surface of the water happen not to be on the lower side of the cylinder, the water will, upon the revolving of the screw, move on in the helix, until it arrives at the point which is on the under side, and coincident with the watery surface. When it has arrived at this point, it cannot afterwards possess any other part of the spiral tube than that which is upon the lowest part of the cylinder, for it cannot move towards H, because this point is situated higher; and since this will even be the case after the surface of the water in the helix has attained the point H, it is clear that it must always be on the under side of the cylinder. Hence, so long as the cylinder continues to revolve, every part of the spiral screw from E will, by degrees, succeed to the under part of the cylinder; and thus the water in the helix must succeed to every part thereof, from E upwards, as it comes on the lower side; that is, it must rise to the lower part of the cylinder through all the length of the tube, until it arrives at the orifice at the top, where it empties itself.

In the *Archimedes propelling screw*, invented by Lieut. Chappel, for propelling vessels instead of lateral paddle-wheels, the screw is fixed at the lower part of the stem of the vessel, so as to project a little under the keel. Its revolving motion is imparted by means of the steam-engine; and the vessel receives its impulse from behind, on the same principle as a single oar, when worked like a scull, impels a boat. The advantages of this propelling screw are, that its action is in no way disturbed by the rolling or leaning sideways of the vessel; and in war-steamers it has the peculiar advantage of being protected in battle from the shots of an enemy; while the lateral paddle-wheels may be crippled or destroyed at the first broadside, and the vessel rendered unmanageable. The great advantages of these screw propellers are every day becoming more and more manifest. They are coming into general use in all our first-rate ships of war, and are likely to effect an entire remodification in our system of naval tactics.

ARCHIRE'S (Gr. ἀρχιερεῖς, chief priests), the highest clerical dignitaries of the Russian Greek church. The superior episcopal orders in Russia are distinguished by the different titles of Metropolitans, Archbishops, and Bishops, who are all indiscriminately styled *Archirès*. These titles, however, are not attached to the sees as in England; but are, at present, merely personal distinctions conferred by the Sovereign, which give the possessors no additional power; for every bishop is independent in his own diocese. After the Archirès, the next in order of dignity are the *Black Clergy*, to which class belong the Archamandrites, or chiefs of monasteries, from amongst whom the bishops, or Archirès, are always chosen; and last of all are the Monks.

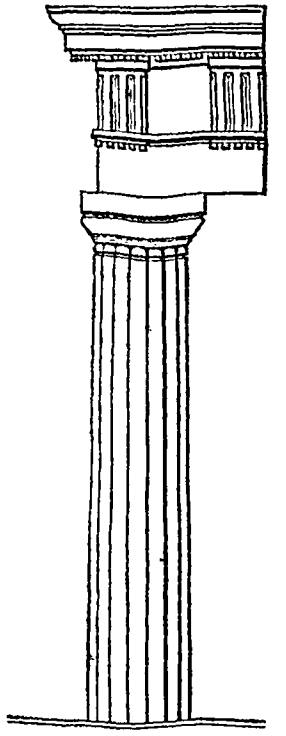
All the Archirès, as well as the Black Clergy, according to the regulations of the Russian Greek church, are obliged to lead rigid and recluse lives. They are even forbidden animal food; and are not permitted to marry after entering the order. In fact, they compose the *regular* clergy, and consider themselves as superior to the secular priests, both as regards rank and learning; the whole powers and dignities of the Russian church being exclusively vested in them. Indeed the greater part of these Archirès are men, who, for piety, learning, and worth, have done honour to their country; but, unfortunately for their literary reputation, they generally write in a language but little known to the other nations of Europe. Among their peculiar privileges may be mentioned their exemption from all civil taxes, and from every species of corporal punishment, even in cases of capital crimes. (Dr. Pinkerton's *Memoirs*.)

ARCHITECTURE (ii. 25). A correct knowledge of the different styles of architecture, as they daily present themselves to the common observer, is of leading importance in the proper understanding of the subject.

Writers on early architecture often take an extended view of the ancient Assyrian, Egyptian, Cyclopean, British, Saxon, and Norman styles of architecture; but this comes more within the province of the archæologist than the modern encyclopedist; and therefore we shall confine ourselves to a few brief notices of the three leading styles of architecture,—the GREEK, the ROMAN, and the GOTHIC,—as they have been transmitted to us from the classical and mediæval ages, and as they exist among us at the present day.

GREEK architecture presents the noblest and most beautiful specimens of art among the ancients, and still remains the purest standard of excellence among the moderns. In all probability it was derived from the Assyrians and the Egyptians. The Greeks, being inferior in wealth, could not equal them in magnificence, but endeavoured to excel them in skill and taste; and thus architecture received successively in Greece and in Italy the different modifications which in the end were denominated *Orders*. What formed an Order was the column with the base and capital surmounted by an entablature, which consisted of an architrave, frieze, and cornice, and sustained by a pedestal. The Greeks introduced only three legitimate orders—the *Doric*, the *Ionic*, and the *Corinthian*; but to these two others have been added—the *Tuscan* and *Composite*. In tracing their history, we find that the Dorians departed the least from the ancient simplicity and heaviness of style. The Ionians introduced some elegancies, and a sort of effeminacy. But when Greece afterwards became the metropolis of the fine arts, architecture became more ornamental; and the Corinthian order, with its florid decorations, was introduced. The shaft of the Grecian column, which gradually diminished towards the top, was regulated, in diameter and length, by these orders. [ORDERS, *Suppl.*]

The annexed is a representation of one of the Doric columns of the Parthenon, with its capital and entablature, its architrave, frieze, triglyphs, &c. Strength, beauty, and majestic simplicity are here finely combined.



DORIC COLUMN.

For the general plan and construction of a Greek edifice, we cannot do better than quote the words of 'Athenian Aberdeen,' when describing a Grecian temple. 'A quadrilateral form (says the Earl), adorned with exterior columns, the roof comparatively low, and composed for the most part of unbroken lines, with the frieze and pediment enriched by the application of sculpture in different degrees of magnificence and profusion, constitute almost invariably the figure of the most splendid Grecian edifices. But, although similar in plan, distinct varieties are observable in these structures each peculiar and consistent in all

its respective parts. The character of massive and imposing grandeur in the Doric style, of adorned yet simple majesty in the Ionic, and of festive sumptuousness in the Corinthian, is preserved throughout the minutest details of the orders.'

The Parthenon of Athens, as represented in all our architectural works and museums, is considered as the most perfect specimen of Grecian Doric. The lines of the capital and the fluting of the columns were so sharp, that a common observer would suppose that the entire column had passed through a lathe. The roses, the plinths, the moulding, the astragals, and all the details of the edifice, exhibit the same perfection.

The ROMANS borrowed what they had entirely from the Greeks. But eventually they superadded a variety of meretricious adornments (besides cupolas, arches, &c.), which in some measure destroyed the noble simplicity of their immortal prototype. In the reign of Augustus, architecture arrived at its height. Under Trajan, Apollodorus excelled in architecture; and it was he who raised the famous Trajan's column, existing to this day.

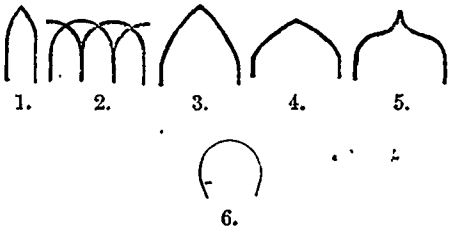
After this period architecture began to decline; and though the care and magnificence of Alexander Severus sustained it for a time, yet it fell with the Western Empire, and sank into a state of debasement, from which it did not recover for upwards of a thousand years. In the fifth century the ravages of the northern barbarians destroyed nearly all the beautiful edifices of classical antiquity; and architecture thenceforward became so coarse and artless, that these professed architects understood nothing of their design. The ROMAN style of architecture, however, had been introduced into Britain by Julius Agricola in the first century; and through his efforts the Britons acquired the knowledge of building temples, market-houses, &c. In the third century, our ancestors thus became famous for the excellence of their architects, who built temples, courts, market-places, and houses, with every accompaniment of saloons, porticos, and mosaic pavements. But in the beginning of the fourth century, the architecture, which the Britons had derived from the Romans, began to decline, in consequence of the beautifying of the city of Constantinople, which drew a vast number of the best artists from the West to the East. In the fifth century the ravages of the Saxons destroyed all the public and private buildings of the Britons, who were thus again reduced to a state of comparative barbarism with regard to the arts. As to the Saxons, it is a matter of dispute whether, on their arrival in this country, they knew anything of architecture; for those remains, which have been attributed to them, are evidently (like the Norman) a species of degraded Roman. The era of Saxon architecture, however, is generally calculated from 597 to 1066; and the Anglo-Norman from 1066 to 1189. But there are scarcely any distinguishing features between the two styles. The characteristics of the Saxon mode of building were very thick walls, massive pillars, with a kind of regular base and capital, and semicircular arches over the doors, windows, &c. The only observable difference in the Norman architecture is, that the column is more elongated, and the curve of the arch smaller. The arches are sometimes ornamented with various figures, and the capitals adorned with carvings of foliage and animals. Both these styles, however, were gradually superseded, in the twelfth and thirteenth centuries, by the GOTHIC or POINTED architecture. On the decline of the florid Gothic, which took place in the Tudor age, a mixed style arose, in which the Roman and Gothic were jumbled together. But in the sixteenth and seventeenth centuries the chaste architecture of the Greeks and Romans revived. The first improvement, or rather restoration, of the ancient classical architecture, was in Italy, which was a kind of ornate Roman, similar to St. Paul's Cathedral, and now so common in many of our great municipal buildings. These improvements passed into most other parts of Europe; and though the Italians were for a considerable period accounted the first architects, our own country at length produced men who successfully rivalled them, — particularly Inigo Jones and Sir Christopher Wren, who left behind them many splendid classical Italian edifices, which will long remain the pride and ornament of this great metropolis.

The GOTHIC, POINTED, or ECCLESIASTICAL architecture, which is the characteristic style of all our old cathedrals and churches, arose after the decline of the Roman power, and flourished during the Middle ages. It is supposed to be of Saracenic or Arabian origin, and to have been introduced into Europe at the period of the first crusades. In contradistinction to the Greek style (which consists of a square-formed edifice, with horizontal and perpendicular lines at right angles), the pyramidal form exists throughout the several component parts; and hence we may comprehend the reason why the arch was made pointed, instead of semicircular like the Roman, as no other form could have been introduced with equal propriety, in a pyramidal figure, to answer the different purposes of uniformity, fitness, and *strength*. The general characteristics consist of numerous and prominent buttresses, lofty spires and pinnacles, large and ramified windows (with mullions and tracery), ornamented niches, sculptured saints and angels, fretted roofs, and profusion of ornaments; but its distinguishing Saracenic characteristics are small clustered pillars and pointed arches. Thus the style may be divided into four general principles: 1. The *Pyramidal* form, which is observable in the general fabric; 2. *Buttresses*, which are intended to counteract the pressure of the vaulted roof, wood-work, and the external covering of lead, &c.; 3. the *Arch*; and 4. the *Clustered Column*.

The *Buttresses* erected in the western front of the abbey church of St. Stephens at Caen, in Normandy, about 1060, and those built by Henry VII., about 1500, at Westminster, demonstrate the progress of architectural enrichments.

The *Arch*, which is composed of segments of circles, and also of nearly straight and undulating lines terminating in a point at the centre, constitutes the *Pointed* arch. The most ancient arch was narrow at the base, (fig. 1.), called the

lancet form. The most correct arch has been considered that which is described by two segments of circles, drawn from an equilateral triangle at the base, (fig. 2.). But when a broader arch (fig. 4.), makes its appearance in Gothic edifices, it is indicative of a later period, when the pointed style was in its decline.



Thus fig. 1. is a lancet arch of the thirteenth century; 3. is the true pointed arch of the fourteenth century; 4. is the broad-pointed arch of the fifteenth century; and 5. is an arch of the time of Henry VII. The horse-shoe arch, 6., is of a still later period.

The *Clustered column* forms an aggregate of small cylinders, divided by mouldings. Sometimes a column consisted of one cylinder only. No rules regulated either the diameter or height; the shaft continuing the same size from the base to the capital.

In the reign of Edward III. several interesting changes took place in Pointed architecture. The most superb style prevailed in the middle of the fourteenth century. In the successive reigns of Richard II. and Henry III. Pointed architecture sustained various retrograde alterations; but a complete change in the style cannot be said to have taken place till the middle, or towards the conclusion, of the fifteenth century. Henry VII.'s chapel, at Westminster, is a beautiful specimen of that height of elegance to which the Gothic style arrived in the sixteenth century.

The whimsical Chinese style, produced by the combination of classic with Gothic architecture, paved the way for the revival of the Grecian style in its purity, by the celebrated Inigo Jones, temp. Charles I. Of late, however, there has been a disposition to perpetuate Gothic architecture in the erection of many new churches and edifices in this style, for which, from historical and other associations, it seems well adapted. The new Houses of Parliament, now in the course of erection, are in the pure Elizabethan Gothic, with all the enrichments of modern style carried to the highest perfection,—and a most magnificent *coup-d'œil* they certainly present to the eye of the spectator.

Military architecture is the art of fortifying a place by making works around it; so that it may be defended, by a small force, against the attacks of a numerous enemy. This, like gunnery and strategy, is a branch of study necessary for military and naval officers.

(Vitruvius; Pugin; Britton; Fosbroke; Nuttall; &c.)

ARCTIC VOYAGES. Various nations have at different periods attempted to penetrate the icy barrier that closes the Arctic Seas. In the ninth and tenth centuries the Scandinavians, those early monarchs of the main, visited these regions; and they were followed, at an interval of some centuries, by Venetian, Portuguese, and Spanish navigators. Sir Hugh Willoughby was sent out with three ships in search of a north-east passage, in 1553, and having discovered Nova Zembla, and pushed into the White Sea, he was found the next year by some Russian fishermen frozen to death. Sir Martin Frobisher undertook three voyages between 1576-78, and discovered the entrance to Hudson's Strait. Sir Humphrey Gilbert followed, and Davis accomplished three voyages between 1585-88. He not only explored the coasts of Greenland, but also penetrated much further in the Polar Seas, than any of his predecessors had done. French, Dutch, and Danish sailors distinguished themselves about this time in the search for the north-west passage. Henry Hudson made three voyages between 1607 and 1610, from the last of which he did not return, his crew having mutinied and turned him adrift with his son in an open boat. He discovered and gave his name to Hudson's Bay; and in 1616 William Baffin pushed as far as the bay that bears his name. Parliament in 1743 offered £20,000 to any one who should find a north-west passage, by Hudson's Strait. Between 1769-72 Mr. Hearne journeyed three times overland to the shores of the Polar Seas. Captain Phipps (afterwards Lord Mulgrave) sailed in 1773, having Nelson, then a mere boy, on board one of his ships; and in 1776 Captain Cook went in the same direction. In 1789 Mackenzie proceeded overland, and in 1790 Captain Duncan by sea. Other researches were afterwards made by enterprising navigators in these regions of frost and snow. In 1818 two expeditions were despatched, one to the North Pole, and the other in search of the north-west passage. Captain Ross and Lieutenant Parry commanded the latter, while Captain Buchan and Lieutenant Franklin undertook the former expedition. In 1819 Franklin started on the land expedition, and returned to England in 1821, having suffered severe hardships, and performed a journey of 5550 miles. Parry sailed with two ships in 1819, returning to England in 1820; he made a second voyage with the *Fury* and *Hecla* in 1821. Clavering went on a scientific voyage in 1823, and Lyons in 1824. Both of these enterprising men accomplished the voyage in the same gun-brig, the *Griper*, of 120 tons. In 1824 Parry made his third voyage in the same vessels used in his second expedition, but having been compelled to abandon one of them, the *Fury*, he returned home in 1825, fully convinced of the existence of the north-west passage. Franklin undertook a second land expedition in 1825, returning to England the next year. Captain Beechey sailed in the *Blossom* in 1826, and Parry went on his fourth voyage, in his old ship the *Hecla*, in 1827. In 1829 Captain Ross sailed in the *Victory*; but having been compelled to abandon his ship, after suffering innumerable privations, he reached England in 1833. In the mean time Captain Buck volunteered to go on a land expedition in search of Ross, and

only returned after an absence of two years and a half. This bold navigator sailed again in 1836 in the *Terror*, on a voyage of discovery to Hudson's Bay. In the same year the Hudson's Bay Company sent out Messrs. Dease and Simpson, for the purpose of making surveys, and having discovered two rivers, a new tract of land, called Victoria Land, and obtained valuable information, they returned in 1839. Dr. Rae was despatched by the same company to prosecute further explorations, in 1846, and on the 26th of May, 1845, Sir John Franklin, with the *Erebus* and *Terror*, sailed on his last expedition, from which he never returned. Several expeditions by sea and land were despatched in search of the missing navigators, and both the Government and Lady Franklin, as well as learned societies and the public generally, did all that lay in their power to succour these noble and enterprising men. In 1853 Dr. Rae again started on the search, and purchased, from a party of Esquimaux, the relics of Sir John Franklin, now deposited in Greenwich Hospital. On the morning of the 26th of Oct. 1850, Captain McClure discovered the north-west passage, which has been, for so many centuries, an object of perilous adventure; and there can be little doubt that Sir John Franklin had made the same interesting discovery.

With reference to these Arctic Explorations, a very extraordinary circumstance has recently occurred. Her Majesty's barque *Resolute*, of 500 tons, which formed a portion of Sir Edward Belcher's squadron of discovery, was, with other ships, abandoned by orders of the commander of the expedition in 1854. These deserted ships had been locked in the ice in the Polar Seas; but Captain Kellet was very unwilling to abandon his vessel, the *Resolute*, feeling assured that she would be released in the following summer. Sir Edward Belcher's orders, however, left this gallant officer no alternative; yet the results have proved the accuracy of his views. In September, 1855, the *Resolute* was picked up by an American whaler, having drifted nearly 1200 miles from the spot in which she had been abandoned. The American government purchased the vessel from the whalers, had her repaired and refitted with the greatest care, and sent her, thus restored, as a present to the Queen of England. The *Resolute* reached Portsmouth on the 12th of December, 1856. On the 16th Captain Hartstein received the Queen on board, and after the usual introductions and interchanges of civilities, said, "Allow me to welcome your Majesty on board the *Resolute*, and, in obedience to the will of my countrymen and of the President of the United States, to restore her to you, not only as an evidence of a friendly feeling to your sovereignty, but as a token of love, admiration, and respect to your Majesty personally." The Queen replied with a gracious smile and a frank "I thank you, sir," and remained sometime on board the rescued and restored ship, conversing with the American officers. (See "*Sir John Franklin and the Arctic Regions*," *by F. L. Simmonds.*)

ARCHON'TICS, a Christian sect of the second century, who maintained that the world was created by certain subordinate powers called *Archontes*, or superior angels, and not by the Omnipotent himself; but by a singular want of gallantry they ascribed the creation of women to the agency of devils.

ARE'NA (Lat. *sand*), that part of a Roman amphitheatre where the gladiators fought.—The *Arenarii*, who combated with wild beasts, were slaves of the most degraded rank; so that if manumitted they were incapacitated from becoming citizens.

ARGENTUM ALBUM, a general name, among our mediæval ancestors, for silver coin or small pieces of bullion that formerly passed for money. Thus rents to the king, according to Domesday tenure, were usually paid *in argento albo*, or common pieces of silver money; while other rents were paid *in libris pensatis*, that is, in metal of full weight and purity. *Argentum Dei*, or God's penny, signified money given to confirm a bargain.

ARGYLESHIRE (ii. 59-64). According to the census of 1851, the population of the county was 89,298, which in 1841 amounted to 97,371, being a decrease of 8,073. According to the same return the shire contains 3,210 square miles, of which 2,735 belong to the mainland, and 1,063 to the islands. The population of the three principal places was—

Campbeltown	9,381
Inverary	2,229
Oban	1,742

ARITHMETICAL MACHINE (STAFFEL'S). Among the wonders of the age we may class a machine by which sums in addition, subtraction, multiplication, and division, may be performed, and by which even powers, roots, and fractions may be calculated. In 'Novelties, Inventions, and Curiosities in Arts and Manufactures," it is thus described: "Externally, the machine is small, and rather plain; but its internal construction must necessarily be complex. It is an oblong brass box, about four inches high. On the upper face are the words, 'additio,' 'subtractio,' multiplicatio,' divisio,' ranged in a semicircle; and to whichever of these an index is turned by a small handle, the machine is then in a state to perform that particular rule or operation. We see seven small holes, with movable plates beneath them, marked by numerals; seven similar holes in the peripheries of seven little vertical wheels; and thirteen number-holes, if we may so designate them, in another piece of apparatus. Each set of seven holes has a traversing movement, but the longer series is immovable. The principle of the operation is somewhat as follows: The two smaller frames are adjusted to the conditions of the question, so as to represent two sums to be added, or two to be multiplied, &c.; and then, on turning a handle, the answer appears at the thirteen holes of the other frame. Every one of the twenty-seven holes has ten numerals (0 to 9) belonging to it, and any one of these ten may appear at the opening, according to the adjustment for the solution of each question. The machine can multiply seven figures by seven figures (or millions by millions), and can display

analogous powers in the other arithmetical processes. There is one little feature in this machine, which seems to approach nearer to the volition or judgment of an intelligent being than even the calculating itself. The machine corrects certain errors, into which the computor might himself inadvertently fall. For instance, if the machine is set to subtract a larger number from a smaller, or to divide a number by another larger than itself, the machine *cannot* and *will* not do it: it rings a bell, and then stops work. The mechanism by which this singular result is brought about is small, but intricate; it shows, however, how many mental processes may, to a certain extent, be imitated by wheels and levers."

ARK OF THE COVENANT, in Scripture history, was a kind of sacred chest, wherein the Jews deposited the two tables of stone on which God had engraven the ten commandments, the golden pot of manna, and Aaron's rod. In the sacred records it is minutely described as being of shittim wood, covered with plates or leaves of gold. It was two cubits and a half in length, a cubit and a half wide, and a cubit and a half high. (Calmet.) — The *Ark of Isis*, or *Campsa* chest, in a similar way, contained the sacred symbols of religion among the Egyptians. Plutarch, speaking of the rites of Osiris, mentions the sacred ark as containing a golden boat, and being borne by priests in the religious ceremonies. According to Hesychius, this ark was called *Theba*, *Baris*, and *Argo*.

ARKITES, in ancient history, a Sidonian branch of the great family of Canaan, who inhabited Arka and the adjacent country, situated between Tripolis and Antaradus, at the western base of Lebanon. (Calmet.)

ARMAGH, County of, in Ireland (ii. 117-119). According to the census of 1851, the population was 196,085, and that of the principal places as follows:—

Armagh	12,654
Lurgan	4,205
Portadown	3,091
Tanderagee	1,496

ARMORIAL BEARINGS, and ROYAL COATS OF ARMS. Camden refers the origin of armorial bearings in England to the period of the Norman kings, when they first became hereditary. Their actual use (says he) were not established till the reign of Henry III. About that time it became the custom in England for private gentlemen to bear arms; borrowing them from the lords of whom they held in fee, or to whom they were most devoted. After the appointment of courts military, and a constable and marshal in the Norman era, armorial honours flowed freely from the throne to the chieftain, and from the chieftain to his followers; and the Crusades tended rapidly to augment their number, both in England and on the Continent. The multiplication of *ordinaries*, *charges*, *augmentations of honour*, &c., for the purpose of distinguishing different families, and their several branches, soon became boundless; and there is scarcely any object in nature or art that has not been thereby represented. In addition to those numerous devices represented on the shield, were the helmet, crest, supporters, and motto; and, as the emblems of sovereignty and nobility, crowns and coronets. Edward III. was the first who bore a crest upon his helmet; and the knights of the Garter followed the example of their sovereign. The fashion then soon became prevalent.

Having thus briefly noticed the origin of armorial honours, we shall now present an historical synopsis of the arms, &c. of the royal families of England from the Norman era,—a knowledge of which is requisite to determine the ages of buildings, coins, medals, &c.

William I. and II. bore gules, two lions (*leos pardés, not leopards*) passant gardant Or; and for Matilda of Flanders, gyronny of eight; in the nombril point a plain shield gules.— Henry I. and Matilda of Scotland; England as before, and Scotland.—Stephen and Matilda of Boulogne; gules, 3 sagittaries Or, 3 torteaux.—Henry II.; England; and, gules, 1 lion passant gardant, for Eleanor of Aquitaine; his cognizances were, a crescent beneath a star, an escarbuncle of eight rays, and the broom plant, from his name Plantagenet.—Richard I.; 3 lions passant gardant for England, and a cross botonné Arg. for Berengaria of Navarre; Dieu et mon Droit first assumed by him.—Henry III.; England; paly of eight, Or and gules, for Eleanor of Provence.—Edward I.; as Prince of Wales, arms of England, with a label of 3 or 5 points; as king, with Eleanor of Castile, England, with quarterly, 1 and 4 a castle, 2 and 3 a lion rampant; with Margaret of France, England and Semée de lis.—Edward II.; the same as his father, with two small castles on the side of his throne to show his descent, through his mother, from Castile.— Edward III.; England, within a border of France, *i. e.* Az. semée-de-lis, placed on his throne, between two fleur-de-lis, to show his descent from France. This monarch first quartered the arms of France in 1358; his cognizances were the sun issuing from the clouds, the stump of a tree sprouting.—Richard II.; France and England quarterly, with a label of 3 points, the middle point charged with the cross of St. George, which he relinquished on his father's decease. He assumed other arms, as the pretended arms of Edward the Confessor, &c., and was the first who bore supporters, being two angels.—Henry IV.; France and England quarterly, 5 fleur-de-lis, with Richard's supporters.— Henry V. and VI.; France and England quarterly, the fleur-de-lis reduced to three, in imitation of Charles VI. of France.—Edward IV.; France and England; supporters, the black bull of Clare, and white lion of Mortimer; crest, the fleur-de-lis of France and lion of England conjoined; likewise with two lions' supporters, and arms within the Garter. — Edward V.; France and England; supporters, a lion and white hart.— Richard III.; France and England, between two boars, or a bull on the right and a boar on the left.—Henry VII.; France and England, surrounded with the Garter, and ensigned with a large crown; crest, the portcullis, from his mother of the family of Beaufort; supporters, a red dragon, from Cadwallader, last king of the Britons,

from whom he claimed descent; on the left a greyhound Arg. collared gules, from the Somersets; badges, the white and red rose per pale.—Henry VIII.; France and England; supporters, a red dragon and greyhound in the early part of his reign; afterwards a lion of England crowned, and the red dragon sinister; for Catherine of Arragon, impaling Castile and Leon, and Arragon and Sicily.—Edward VI.; France and England; supporters, a lion and griffin.—Mary; a lozenge, 1 and 4 France, 2 England, 3 Spain, for Philip her husband; supporters, an eagle dexter, and a lion rampant gardant sinister, according to Nisbet, but, according to Willemens, a greyhound and crowned eagle.—Elizabeth; France and England, ensigned with imperial crowns; supporters, a lion dexter crowned, a red dragon sinister.—James I. and his successors; France, England, Scotland, and Ireland, differently blazoned; supporters, lion and unicorn, from the union of England and Scotland. These arms remain to this day, with the omission of the arms of France. (Nuttall's *Archæol. Dict.*)

ARNAUD, MARSHAL ST., the commander-in-chief of the French expedition to the Black Sea, and grand Ecuyer to the Emperor. This distinguished officer was born in Paris, of humble parentage, in 1801. At the age of fifteen he entered the Gardes du Corps, and became a sub-lieutenant in the infantry of the line; but he soon quitted the army, and engaged himself as a player at the little theatre of the Batignolles. In 1831, however, he entered the 64th regiment of the line as sub-lieutenant, and was afterwards raised to the grade of lieutenant. In this capacity he took an active part in the war of La Vendée, and was subsequently attached, as orderly officer, to Marshal Bugeaud. In 1836 he was sent to Algiers, and was then promoted to the rank of captain. At the siege of Constantine he greatly distinguished himself, and received the cordon of the Legion of Honour. Having by his bravery and skill been eminently successful in various battles, he rapidly passed through the different grades of military rank, until he became general of division; and the expedition which he undertook, in 1851, against the Kabyles was one of the most glorious campaigns ever gained by the French army in Algeria. With little more than 6000 men at his command, he subdued the whole of that savage mountainous region. On his return to Paris he was made Minister of War and a Marshal of France. He was also nominated a Senator, and grand Ecuyer to the Emperor, and received the grand cross of the Legion of Honour.

On the declaration of war against Russia, Marshal St. Arnaud was appointed to the command of the army of the East. But unfortunately he had been long suffering, at times, from a chronic disorder of the mucous membrane of the bowels; and his passage from Varna to Eupatoria did not fail to bring back the malady. When engaged in the passage of the Alma he was in a state of severe suffering; and yet for twelve hours he persevered with undying energy in the glorious struggle, which redounded so brilliantly to the honour of the French and English arms. For two days after, he still continued to exercise his functions, with the most heroic determination; but at length, on the increase of his malady, he considered it his duty to resign his important command, agreeably to the Emperor's provisional orders, into the hands of Lieut.-General Canrobert. On the 27th of September, 1854, he embarked for Constantinople, and died on his passage. His body was brought to France, and on the 19th of October deposited in the vaults of the Invalides, with every mark of public respect.

ARNOLD, REV. THOS. K., celebrated as the author and editor of a complete library of books adapted for educational purposes, and particularly of the valuable series, entitled 'School Classics.' He was born at Stamford in 1800; and graduated at Cambridge as B.A. in 1820. In 1830 he was presented to the rectory of Lyndon in Rutlandshire,—a small parish, which allowed him leisure for the multitudinous literary undertakings with which his name is extensively associated. One of his earliest productions was 'The Essentials of Greek Accidence,' published in 1838; and in the same year he produced 'A Practical Introduction to Greek Prose Composition,' which was followed by other works of a similar useful character. But the works for which he is best known, and which have contributed the most to his celebrity as a critic and a scholar, is the series of 'School Classics,' of which he was the acting and responsible editor, and in which he has availed himself very extensively of the labours of the scholars of Germany. In the Greek language, the volumes include portions of Homer, Herodotus, Thucydides, Demosthenes, Æschines, Sophocles, Euripides, and Aristophanes; and in the Latin language we have Virgil, Horace, Cicero, Tacitus, Ovid, and Cornelius Nepos. Mr. Arnold also edited a series of Handbooks for the Classical Student, chiefly translated from the German; and, in conjunction with the Rev. J. E. Riddle, he produced an English-Latin lexicon, founded on the German-Latin lexicon of Georges; to which, as he tells us, he devoted 'five or six years' very hard labour.' Independently of his classical publications, Mr. Arnold for three years conducted a series of small periodical works on religious subjects. He abridged, with considerable care, the American translation of Hengstenberg's Christology, and published five pamphlets on theological and ecclesiastical questions, which were then agitating the English Church. He was also the author of a volume of 'Sermons for Sundays, Festivals, and Fasts,' published in 1845. Latterly, he was engaged as editor of 'The Theological Critic,' which was commenced in 1851.

In a recent defence which Mr. Arnold was called upon to make, in reply to a bitter attack in 'Fraser's Magazine,' charging him with piracy, avarice, and unsound scholarship, he presents a summary of his numerous publications, and concludes by observing, 'The list of my works is undoubtedly a very long one; but regular industry, with a careful division of time and employments, carried on with hardly any exception for six days in every week, *will* accomplish a great deal in fifteen years.'

This indefatigable writer died of bronchitis, after a very short illness, on the 9th of March, 1853; and it may be truly said, that his unexpected decease deprived the country of one of its most distinguished scholars, and the Church of England of one of its most faithful disciples.

ARNOLDISTS, a sect of reformers who rose in the 12th century, so called from their chief, Arnold, a priest of Bresse, who was a great declaimer against the wealth and corruptions of the Romish clergy. He also preached against baptism and the sacrament of the eucharist. His followers were also denominated *Poplicani*, or *Publicans*. After having caused a great many disturbances, he was arrested, condemned, and hanged at Rome, and his ashes thrown into the Tiber. (Nuttall's *Archæol. Dict.*)

ARNOTT, Dr. [WATER-BED, *Suppl.*]

ARPEN, or ARPENT, in the language of the Domesday book, was a plot of ground somewhat less than one acre. According to the French account an arpent made 100 perches; and the most ordinary acre, called *arpent de France*, is 100 perches square.—*Arpentator*, in the Middle ages, was a surveyor or measurer of land.

AR'QUEBUSE à Croc, an old species of firearm, resembling a musket, but which was supported on a rest by a hook of iron, fastened to the barrel. It was somewhat longer than a musket, and of larger calibre, and formerly used to fire through the loop-holes of antique fortifications.

ARROYO DEL MOLINOS, a small town of Spain, near the river Gundiana, celebrated for a victory gained by Lord Hill, in 1811, over general Gerard. In this decisive contest the French lost 1500 prisoners, some of them of high rank, as the prince d'Aremberg, general Brun, three colonels, thirty captains, and many inferior officers. General Gerard escaped with a mere handful of men.

ARRU'RA (Lat. *aratrum* a plough), in the feudal age, a day's work at the plough. Thus customary tenants were bound to plough certain days for their lord, which service was called *operatio arruræ*. (Kennet's *Paroch. Antiq.*)

ART may be defined as the power of doing something not taught by nature and instinct, or an ingenious or scientific arrangement of natural objects and materials, so as to supply the various wants of mankind, or minister to their enjoyments and happiness. Thus we have the art of writing, of printing, of weaving, of turning, of pyrotechny, of masonry, &c. The ARTS, as used in the plural, are generally divided into *useful* or *mechanical*, and the *polite* or *liberal*. The *useful* are such as we have just enumerated; the *polite* arts are those of music, painting, poetry, sculpture, &c.

ARTESIAN WELLS. [KISSINGEN, *Suppl.*]

ARTIFICIAL FUELS. Several patents have of late years been taken out for the production of artificial fuel, and many manufactories are at this time in full operation. Azalay's bright blocks are made from coal-dust; Warlick's patent fuel is manufactured from the dust of various kinds of coal; Oram's is a condensed mixture of small coal, bitumen, and sand; and Williams's fuel is a mixture of dried peat and bitumen. The Bideford Anthracite Company make artificial fuel, in pieces in the form of bricks, by a particular mode of treating anthracite. It would be impossible to enumerate all the new methods for economising our supplies of fuel, and enabling us to husband our resources. Some of them will doubtless soon come into general use.

ARTILLERY. The early history of artillery, and its application in mediæval warfare, have already been given (ii. 197). In modern parlance, the word only applies to cannon, or heavy ordnance; and embraces, 1st, guns and their equipments; 2nd, the troops serving them; and 3rd, the science of their use and construction. There are both *foot* and *horse* artillery; the first is divided into companies, and the latter into troops; and both branches are formed into *brigades*. A brigade of artillery generally consists of six or eight pieces of cannon, with all the machinery and officers to conduct them, together with the necessary apparatus thereto belonging. A *park* of artillery is the place or position selected for forming the grand depôt of guns, ammunition, and stores, to be in readiness as occasion may require. *Flying artillery* is a term in common use for those pieces of ordnance which can be carried, by means of horses, with great speed, from one place to another. A *train of artillery* is a complete set or number of pieces of ordnance, mounted on carriages, and ready for field operations. The royal artillery have their head-quarters at Woolwich; and Woolwich arsenal is the principal artillery depôt of the kingdom. The pay and allowances of the royal artillery and horse brigade are nearly the same as those of the engineers.

ARTILLERY COMPANY (the Hon.), a band of infantry rifles and artillery, which form part of the militia or city guard of London.

ASHBURTON, ALEXANDER BARING, LORD, an eminent statesman and financier, the second son of Sir F. Baring, Bart., and for many years the head of the great mercantile firm of Baring Brothers and Co. He was born in 1774, and after due initiation into the general business of London, he went to the United States, where he aided in swelling the vast fortunes of the great mercantile house with which he was connected. His political life commenced in 1812 as member for Taunton, which borough he continued to represent till 1820. He afterwards sat for Callington, in successive parliaments, till 1831; and in 1832 he was returned for North Essex. His lordship commenced his political career as a moderate Whig. On the formation of the Peel ministry, in 1834, he was appointed president of the Board of Trade; and in 1835 he was raised to the peerage. Sir Robert Peel had so high an estimate of his diplomatic and statesmanlike abilities, that in 1842 he appointed him a special commissioner to settle the disputes about the Oregon territory, which, at the time, threatened to involve this country in a war with the United States. His negotiations were ably conducted, and the dispute was brought to a favourable issue. He continued to support the policy of Sir R. Peel, until the final measure of free trade in corn was

proposed in 1846, when his position, as a peer and a great land-owner, probably overcame the political convictions of his mind. From that period to the time of his death, which took place in 1848, he seldom appeared in the political arena.

ASIARCH, a pontifical chief in Asia. In proconsular Asia, the Asiarchæ, or Asiarchs, were the chief presidents of the religious rites and observances. Their office was annually to exhibit solemn games in the public theatre in honour of the gods and the Roman emperor.

ASSAULT, in a military sense, is a sudden but organised personal attack on a fortress, camp, or fortified post, with a determination to carry it. The party which leads the assault is usually called "the forlorn hope," from the desperate valour which must be called into action. While an assault continues, the batteries of the besiegers cease to play.

ASSES, FEAST OF, a religious festival, or farce, celebrated by our ancestors during the Christmas festivities. Mr. Warton has given us some account of it. On Christmas day (says he), the prophets, as the actors were called, were dressed according to order, and a furnace was prepared with linen and tow in the middle of the church nave. A procession then moved from the cloister, and two clerks in capes, from the second seat, directed the procession, singing certain verses, which were repeated by a chorus. After a few verses the procession stopped in the middle of the church; while six Jews were ready on one side, and six Gentiles on the other. The latter then called to the Jews, who made their speech, and after that to the different prophets in succession, who, in reply, quoted a text of Scripture. After some other ceremonies all the prophets and ministers began a chaunt, with which the feast terminated. This festival, like the *Feast of Fools*, and other religious farces, was instituted by Theophylact, patriarch of Constantinople, at the end of the tenth century, and exhibited in the Greek church. It was soon afterwards adopted by the Romish church; and eventually introduced into this country.

ASYLUM, ROYAL MILITARY, a national institution erected at Chelsea, county of Middlesex, for the reception and education of the children of soldiers of the regular army. The first stone was laid by the late Duke of York on the 19th of June, 1801. The direction and control of the institution are placed in the hands of commissioners appointed by Her Majesty, the principal of whom are the commander-in-chief, the secretary-at-war, the master-general of the ordnance, and other high officials connected with the government. The number of boys on the foundation is about 1000; but a branch of the asylum is established at Southampton for the maintenance and education of girls. In the selection of children for admission to this establishment, preference, in general, is given,—1st, to orphans; 2nd, to those whose fathers have been killed, or have died on foreign service; 3rd, to those who have lost their mothers, and whose fathers are absent on duty abroad; and 4th, to those whose fathers are ordered on foreign service, or whose parents have other children to maintain.

Connected with the Military Asylum is CHELSEA HOSPITAL, the great national asylum for decayed and maimed soldiers, and one of the noblest foundations of the kind in Europe. [CHELSEA HOSPITAL, *Suppl.*]

ATELIERS NATIONAUX. In the *Nouveau Dictionnaire de la Conversation*, the word *atelier* is explained as signifying the place in which one or more persons exercise their trade or art. The *ateliers nationaux*, or national workshops, were first established at Paris during the revolutionary troubles of 1848. The object of the provisional government was to provide occupation and sustenance for the numbers of unemployed workmen then in the French capital. At first these pensioners upon the state amounted to 13,000; but in a very short space of time between 105 and 106,000 workmen, many of them discontented, idle men, were inscribed on the registers of the national workshops. Not only common labourers but even artizans, mechanics, and professors of the liberal arts, availed themselves of this resource, and actors, literary men, artists, &c., swelled the crowd of needy adventurers. After the terrible events of June, 1848, brought about in a great measure by the intrigues of these men, the government determined upon suppressing the national workshops. On the 3rd of July, General Cavaignac stated in the Assembly, that these establishments presented a formidable organisation; menacing to liberty and the republic, and that they must consequently be dissolved. Some attempts at rioting occurred, but the malcontents were dispersed, these establishments suppressed, and, in the words of Lamartine, the national workshops proved to be but "a temporary experiment."

ATELLA'NÆ, satirical or humorous pieces represented in the Roman theatres, so called from having been first performed at Atella, a city of Tuscany. After dramatic acting was gradually converted into an art, the Roman youth, leaving regular plays to be acted by professed players, reserved to themselves the acting of ludicrous pieces or farces, interlarded with buffoonery, called *Fabellæ Atellanæ*. They were introduced after the play (when the players and musicians had left the stage), to remove the painful impressions of tragic scenes. The actors of these farces retained the full rights of citizens, and were allowed to serve in the army, which was not the case with professional actors, who were not respected among the Romans. These Atellanæ corresponded, in some measure, with the *Satyræ* of the Greeks; but at length they became so licentious and impudent, that the senate was obliged to suppress them.

ATHEISM (Gr. α and Θεὸς, without God), the disbelief in a Supreme Being. In the strict sense of the word, it is characteristic of those who do not believe in the existence of a God, or who acknowledge no being superior to Nature. The doctrine of atheism, however, has been so repugnant to mankind in general, that its votaries have frequently assumed a milder name than that

of atheist. Thus, about the beginning of the last century, they usually styled themselves "Free-thinkers," "Illuminati," or "Philosophers." On investigating their doctrines we find that some of them attribute the wondrous phenomena of nature to a fortuitous concourse of atoms, agreeably to the laws of the atomic philosophy, as promulgated by Diagoras, the Greek philosopher. Some attribute the great operations of nature to the immutable laws of a stern necessity, and maintain that they could not be otherwise than they are; while others, more diffident, do not pretend to account for the existence of the material universe, or the ever-changing phenomena of nature, but admit that they know nothing about it, and conclude that matter has always existed, and ever will exist, and has always been subject to continual changes; that it is, in fact, as it has always been, and ever will be, and could not possibly be otherwise.

Monstrous, and even revolting, as the doctrine of atheism may appear to the mass of mankind, still it seems to have had its votaries among the learned of almost every age and nation. What Plato told a young philosopher of his day contained evidence of this melancholy truth. 'Not thou alone,' says Plato, 'nor thy friends, have been the first who have entertained this (atheistical) sentiment of God; but from *time immemorial* there have been more or fewer who have laboured under this disease.' Accordingly we find that atheistical principles were long cherished in Greece, and particularly among the atomical, peripatetic, and sceptical philosophers. Carrying their speculations and daring hypotheses into the very essence of the Divinity, they at first doubted, and at length denied, the existence of a First Cause independent of nature, and of a Providence that superintends its laws. These principles, together with the learning of Greece, were eventually translated to Rome, where the poet Lucretius was the great exponent; but, excepting in Italy, we hear very little of atheism for many ages after the Christian era. Subsequently to the Reformation, we have the names of different writers in favour of atheism; the principal of which were Machiavel, Spinoza, Vanini, Hobbes, Blount, and Mirabaud. In the seventeenth and eighteenth centuries the doctrines travelled over the Alps, and deeply infested France and other portions of Europe. It is related that in the year 1623, there were in Paris alone 50,000 atheists; and at the end of the succeeding century, France made the attempt to govern mankind without any religion at all; in fact, to make reason the only object of worship, and philosophy the only guide in social ethics. But the experiment of eight years (from 1794 to 1802) only proved that to establish atheism permanently in any nation, is a vain and chimerical attempt; for mankind, in general, will have some religion, whether true or false; without which the social edifice (as it was in France itself) must soon be reduced to one universal chaos. Mr. Locke, who was an ardent friend of toleration, would not admit that atheists should be tolerated, because they were incapable of being bound by any obligation of an oath, or of an affirmation in the sight of God, which is equivalent to an oath. And it is satisfactory to reflect that in our own country all the ablest laymen and most profound philosophers have been the firmest believers in the existence and superintendence of a Deity. For, as Lord Bacon has wisely remarked in his Essays, 'A little philosophy inclineth men's minds to atheism; but depth in philosophy bringeth men's minds about to religion; for while the mind of man looketh upon second causes scattered, it may rest in them, and go no farther; but when it beholdeth the chain of them confederated and linked together, it must needs fly to Providence and Deity.'

ATHENÆ'A (Gr. Ἀθήνη, a name of Minerva), public places, in the form of amphitheatres, where professors of the liberal arts held their meetings, and poets rehearsed their verses. They were first held at Athens, where the most celebrated assemblies took place; and afterwards at Rome and Lyons; the second of which, according to Aurelius Victor, was built by Adrian.—*Athenæa* was also the name of the Grecian festivals celebrated in honour of Minerva, sometimes called *Panathenæa*.

ATHLE'TÆ, or ATHLE'TES (Gr. ἆθλος labour), were persons, among the classical ancients, of great agility and strength, who contended for prizes at the Olympic, Isthmian, and other public games. These persons were formerly held in the highest honour. The praises of the victorious athletæ form one of the principal subjects of the lyric poetry of Greece. Each of the four books of Pindar takes its title from the games in which the combatants signalised themselves; and whose victories these poems celebrate. Statues were erected to the victors, especially in the Olympic games, in the very place where they had been crowned; and sometimes in that of their birth also; which was commonly done at the expense of their country. The athletæ, before their exercises, were rubbed with oils and ointments to make their bodies more supple and vigorous. They were naked only in some exercises, as wrestling, boxing, the pancratium, and the foot race. The persons who presided in the games were called *Agonothetæ*, *Athlethetæ*, and *Hellanodicæ*. They registered the name and country of each champion; and upon the opening of the games a herald proclaimed the names of the combatants.—The *Wrestlers* were matched two against two, and sometimes several couples contended at the same time. In this combat, the whole aim and design of the wrestlers was to throw their adversary upon the ground. Both strength and art were employed for this purpose. They seized each other by the arms, drew forwards, pushed backwards, used many distortions and twistings of the body, locking their limbs into each other's, seizing by the neck, throttling, pressing in their arms, struggling, plying on all sides, lifting from the ground, dashing their heads together like rams, and twisting one another's necks. In this manner the athletæ wrestled standing, the combat ending with the fall of one of the competitors. But when it happened that

the wrestler who was down, drew his adversary along with him, either by art or accident, the combat continued upon the sand, the antagonists tumbling and twining with each other in a thousand different ways, till one of them got uppermost, and compelled the other to ask quarter, and confessed himself vanquished. Homer describes the wrestling of Ajax and Ulysses; Ovid, that of Hercules and Achelous; Lucan, of Hercules and Antæus; and Statius, in his Thebaid, that of Tydeus and Agylleus. The wrestlers of greatest repute amongst the Greeks were Milo of Crotona, and Polydamus. The latter, alone and without arms, killed a furious lion upon Mount Olympus, in imitation of Hercules, whom he proposed to himself as a model in this action.—The *Boxers*, or combatants with the fist, covered their hands with a kind of offensive arms, called *cestus*, and their heads with a sort of leather cap, to defend their temples and ears, which were most exposed to blows, and to deaden their violence. The cestus was a kind of gauntlet, or glove, made of straps of leather, and plated with brass, lead, or iron; their use was to strengthen the hands of the combatants, and to add violence to their blows. Boxing was one of the roughest and most dangerous of the gymnastic combats; because, besides the danger of being crippled, the combatants ran the hazard of their lives. They sometimes fell down dead or dying upon the sand; though that seldom happened, except the vanquished person persisted too long in not acknowledging his defeat; yet it was common for them to quit the fight with a countenance so disfigured that it was not easy to know them afterwards, carrying away with them the sad marks of their vigorous resistance, such as bruises and contusions in the face, the loss of an eye, their teeth knocked out, their jaws broken, or some more considerable fracture. We find in the poets, both Latin and Greek, several descriptions of this kind of combat. In Homer, that of Epeus and Euryalus; in Theocritus, of Pollux and Amycus; in Apollonius Rhodius, the same battle of Pollux and Amycus; in Virgil, that of Dares and Entellus; and in Statius, and Valerius Flaccus, of several other combatants.—The *Pancratium* was so called from two Greek words, which signify that the whole force of the body was necessary for succeeding in it. It united boxing and wrestling in the same fight; borrowing from one its manner of struggling and flinging, and from the other the art of dealing blows, and of avoiding them with success. The athletæ also contended in the exercises of racing, throwing the discus, &c.

One of the most honourable privileges granted to the athletic victors, was the right of precedency at the public games. At Sparta it was a custom for the king to take them with him in military expeditions, to fight near his person, and to be his guard, which, with reason, was judged very honourable. Another privilege, in which advantage was united with honour, was that of being maintained, for the rest of their lives, at the expense of their country. (Nuttall's *Class. Dict.*)

ATTESTATION, in a military sense, is a certificate granted by a justice of the peace within a given time after the enlistment of a recruit. It bears testimony that the recruit has been brought before the justice in conformity to the Mutiny Act, and has declared his assent or dissent to such enlistment; and that the proper oaths have been administered to him by the magistrate, and the sections of the articles of war against mutiny and desertion have been read to him.

AUCKLAND, EARL OF, late governor-general of India, First Lord of the Admiralty, and Vice-president of the Senate of University College, London. He was the second son of William first Lord Auckland, and was born in 1784, at Eden Farm, near Beckenham, in Kent. After having graduated at Christ Church, Oxford, he entered Lincoln's Inn as a student in 1806, and was called to the bar in 1809. On the decease of his elder brother in 1812, he became heir apparent to the earldom, and representative of the borough of Woodstock. On the death of his father, in 1814, he succeeded to the peerage as second Baron Auckland. It was not till 1830, however, that he made the least figure in the political world, when he was appointed to the offices of President of the Board of Trade and Master of the Mint, with a seat in the cabinet of Earl Grey. In 1835, his lordship was appointed to the important post of governor-general of India; and the great feature of his government in India was the Affghan war. The contests of the British in favour of Shah Soojah, the legitimate exchief, in opposition to Dost Mahommed, the *de facto* ruler of Affghanistan, have rendered Lord Auckland's government in India most disastrously memorable; but these disasters were subsequently retrieved by the glorious successes of the British arms, and the entire subjugation of the Affghans. [AFFGHANISTAN.] The change of ministry, in 1841, had the effect of recalling Lord Auckland from India, when he was succeeded by Lord Ellenborough. In 1846 his lordship was placed at the head of the Admiralty Board, the duties of which he continued to discharge, to the day of his death, with a degree of ability that has commanded the approbation of all parties. He died on the 1st of January, 1849; and having died unmarried, the earldom has become extinct.

AUDUBON, JOHN JAMES, the distinguished ornithologist, was the son of a French admiral living on a plantation in Louisiana, who took him to France at an early age for the purpose of giving him the full benefit of a European education. At the age of seventeen he returned from France, which was then at the height of her revolutionary frenzy, and in the sylvan retreats of the New World he began his great collection of drawings, under the title of the 'Birds of America.' After his collection had multiplied upon his hands, he undertook, in 1824, a journey to Europe, with the view of obtaining subscribers to the publication of his great work. He was everywhere cordially received. On the continent, Cuvier, Humboldt, and Herschel gave him a hearty welcome; and in Edinburgh he was warmly patronised by Sir Walter Scott, Lord Jeffrey, Sir David Brewster, and Professor Wil-

son; the last of whom gave a graphic description of him in 'Blackwood's Magazine.' In fact he was everywhere hailed as the American backwoodsman, who shared the highest elevations of science with European celebrities. The work which he was enabled to publish is considered as one of our first authorities in ornithological science. On his return to America, he brought out a work on animals, similar to that on birds, which is highly esteemed by all lovers of natural history. In the pursuit of his favourite studies, as a naturalist, he followed the objects of his research into their favourite haunts, and painted them from nature; sometimes spending years away from his family and connections. It was thus that the life-like fidelity and beauty of his delineations raised him to the first rank as an artist, whilst his minute accuracy in describing their habits proves him to have been a close observer of nature. In the social circle he was as much admired as a man, as he was renowned as a naturalist. He died in 1851, full of years and honours.

AUGET, in military engineering, a kind of small trough used for mining purposes, in which the saucisson or train hose is laid in straw, to prevent the powder from contracting any dampness.

AUGUSTINS, or *Austin Friars*, a religious order, so called from St. Augustin, whose canons they observed. They were habited in black, and made one of the orders of mendicant friars. They were originally hermits, whom Pope Alexander IV., in 1256, first congregated into one body under their general Lanfranc.

AUNCIL-WEIGHT, a sort of hand-scale weight, formerly used in England, and described as a kind of hanging scales with hooks fastened to each end of a shaft or beam, which being raised on the forefinger or hand showed the difference between the weight and the thing weighed. In the reign of Edward III. it was prohibited by statute, on account of 'the damage and subtle deceits done to the common people' by its means.

AURA (Gr.), a vapour or exhalation, defined by the old chemists as a pure refined essence, existing in plants and animals, which was perceptible only by its colour.—*Aura divina* is a term used by the ancient poets and metaphysicians for the divine spirit of nature.—*Aura electrica* is applied to the sensation felt as if a cold wind were blowing on the part exposed to electricity when received from a sharp point.—*Aura epileptica* is the sensation felt before a fit of epilepsy.

AURATE (Lat. *aurum* gold), in metallurgical chemistry, is a salt formed by the combination of the auric acid with an alkali.—*Aurate of Ammonia* is produced by keeping recently-precipitated peroxide of gold in strong ammonia for about a day, when a detonating compound of a deep olive colour is generated, analogous to fulminating silver. Its constituents are,—1 equiv. of gold, 2 of nitrogen, 6 of hydrogen, and 3 of oxygen. This compound is sometimes known by the name of *fulminating gold*. (Craig.)

AURE'OLA (Lat. *aureus* golden), the crown of glory formerly given, by Romish divines and sculptors, to saints, martyrs, and confessors, as a mark of the victory they had obtained over the powers of the world and the flesh. The custom appears to have been derived from the classical ancients, who used to encompass the heads of their deities with rays. The word originally signified a jewel which was bestowed on victors at the public games. (Nuttall's *Class. Dict.*)

AU'RICLE (Lat. *auricula* an ear), one of the four muscular bags or cavities of which the heart consists. In the heart there are two auricles and two ventricles, termed the right and the left. The auricles are very uneven on the inside; but smoother on the outside, and terminate in a narrow, flat, indented edge, somewhat similar to a cock's comb, or to the ears of a dog, whence the name has been derived. The term is also applied to that part of the ear which projects from the head.

AUROCLO'RIDES, in chemistry, a kind of crystalline salts, prepared by mixing the chlorides in atomic proportions, and setting the solution aside to crystallize. They generally crystallize in prisms, and contain water of solution. They are of an orange or yellow colour, and consist of single equivalents of their constituent chlorides.

AURUM MUSI'VUM (*Mosaic gold*), a metallurgic combination of tin and sulphur, used as a pigment for giving a golden colour to small statues or plaster of Paris figures. Chemically speaking, it is sulphuret of tin, and may be readily made by dissolving eight ounces of tin in muriatic acid, then precipitating it with carbonate of soda, and mixing this precipitate with four ounces of sulphur. The mixture is then exposed to a gentle heat for some hours in a matrass bedded in sand. It has no taste; but some specimens have a sulphurous smell. The above simple process is within the power of every artist who requires this useful material for painting. (Craig.)

AURUM POTA'BILE (Lat. *potable gold*), a kind of alchemical preparation made by pouring some essential oil on the nitro-muriate of gold, which was formerly esteemed a cordial. Ozanam, in his 'Philosophical Recreations,' as translated by Dr. Hutton, says that the alchemists 'subjected gold to a multitude of operations, by means of which they pretended to render it soluble, like a salt in water. The substance they produced had indeed the appearance of it; but, to speak the truth, it was only gold very much attenuated, and by these means suspended in the liquid; in short, it was in no manner combined with the fluid, and it even gradually deposited itself at the bottom in the metallic form.' The writer then proceeds to describe what he calls the usual process for making potable gold. 'First dissolve gold,' says he, 'in aqua regia; mix this solution with fifteen or sixteen times the quantity of any essential oil, such as that of rosemary, stirring it round, and separate the aqua regia, which occupies the bottom, from the essential oil. If you then dissolve this essential oil in four or five times its weight of well-rectified spirits of wine, you will have a yellowish liquor, known under the name of the potable gold of Mademoiselle Grimaldi. Vitriolic ether, and etherial liquids of different kinds, possess the same property as es-

sential oils; namely, that of seizing on the gold dissolved in the aqua regia. A kind of potable gold, therefore, may be made with ether. This gold may then be taken in drops on sugar, in the same manner as when ether is taken; for this liquor is not mixable with water. The celebrated drops of General Lamotte are not different from the potable gold of Mademoiselle Grimaldi.' The author then proceeds to expose the quackery that pretended to prolong human life by taking these doses of potable gold as cordials. 'What proofs can the alchemists produce, that potable gold is salutary to the human body? Because gold is the most fixed of all metals, because it has the beautiful colour of the sun's rays, and because it is represented in chemical characters by the characteristic sign of that luminary. Are we then to conclude that, when reduced to a liquid form, and conveyed into the blood, it regenerates that fluid, renovates youth, and restores health? What person, accustomed to deduce just consequences from any principle, will ever form such a conclusion? All the virtues of potable gold are founded merely on analogies, invented, without any physical foundation, by fervid imaginations, and by heads deranged by the heat of their furnaces.'

AUSTRALIA (ii. 504–16). Since our account of this important colony was printed, considerable changes have taken place, and Australia has now become the great field of emigration and adventure. What has chiefly contributed to the sudden transition, in all the usual relations of industry and wealth, was the astounding discovery, in 1851, of rich fields of gold, which threw every other consideration into the shade, and excited as complete a dislocation of industrial habits, and of the general value of commodities, as attended a similar discovery in California. Flour immediately rose from 28*s.* to 45*s.* per 100 lbs., and most other provisions in like proportion. The first discovery of the precious metal was made in the neighbourhood of Bathurst, about 120 miles N.W. of Sidney. In a few days there were not less than 4000 persons employed at the diggings, and 25,000*l.* worth of gold was collected in one week. Another discovery, 30 miles south of Bathurst, soon followed; and at length a great variety of other gold-fields were discovered and explored in different parts of Victoria, not far from Melbourne. The original discoverer was a Mr. Hargrave, who has since received a reward of 10,000*l.* From the 29th of September, when the news of the discovery of the gold-fields reached Victoria, to the 19th of November, there had been obtained about 20,282 lbs. of the precious ore. At Ballarat and Mount Alexander the richest deposits were discovered, and the fields were considered as illimitable. In a few weeks there had assembled at the gold diggings about 25,000 persons, and the number since that period has been regularly increasing. Indeed so extraordinary has been the productiveness of the diggings, from their first discovery, as to be estimated, in 1852 and 1853, at the enormous sum of 18,000,000*l.* a year. The effect of this wonderful addition to the material wealth of the country, has been most important. It has produced an entire change in all the social relations of the colony. The demand for labour, as well as the prices of lodging and food, and the payment for labour, have all increased in an unprecedented degree; in some instances quadrupled. Hence a vast amount of emigration has been directed to Victoria and New South Wales, and trade and population have made wonderful advances; though it must be admitted that the reaction and fluctuations of trade have been occasionally productive of much distress among the trading communities.

The gold brought from Australia has been chiefly obtained from the 'diggings' in the detritus of ravines, or in the beds of streams descending from the mountains. It has been found in every form, sometimes as mere grains or dust, sometimes as flakes, or scales; and on some occasions large nuggets, or lumps, weighing from one ounce to 100 lbs. The separation of the small particles from the earth is effected by repeated washings, and the metal is extracted from the quartz rock (which may be considered as its original bed or *situs*) by breaking, crushing, or trituration.

During the last and present year the yield of gold has been steadily increasing. The export of the precious metal for 1855 amounted to 110 tons 8 cwt. 3 qrs. 6 lbs., against 88 tons 8 cwt. 3 qrs. 8 lbs. for the previous year. According to the report of the 'Melbourne Argus,' the receipts by escort and shipments respectively have been:— Receipts for 1854, 1,734,446 oz.; and shipments, 2,122,259 oz.: total, 3,856,705 oz.; — Receipts for 1855, 2,177,887 oz.; and shipments, 2,650,578 oz.: total, 4,828,465 oz. The gold brought down by escort from the various gold-fields in the months of November and December, 1855, amounted to 454,579*l.*; and for the corresponding period of 1854, to 290,636*l.* Thus the increase is gradual and uniformly progressive; for the boundaries of the gold-fields are extending; and the quartz reefs are found to be of such extent, that in all probability they will for centuries defy the power of man to extract their treasures.

The *Melbourne Argus* of June, 1856, states that the yield of the gold-fields for the year 1856 is far in excess of 1855; the return for the thirteen weeks from March 15 to June 7, 1856, being 719,437 ounces, while for the same period of 1855, the return was only 482,864 ounces. The same authority states that at the older fields the systematic washing of the soil and the quartz mining were being steadily prosecuted, and that the difference in the quantities sent down weekly was not to be taken as an indication of any increase or decrease in the yield; as it rather showed the prosperity of the great body of the miners. The gold-fields discovered on the Nicholson River, in the Gipps Land district, were being steadily worked; and at Anderson's Creek, about twelve miles from Melbourne, vast supplies are being produced from the quartz washing. Out of twelve parcels of quartz, weighing 30¾ tons, 443 ounces were lately obtained. Among the numerous instances of individual success, it is mentioned that

a party of three miners, working in the Back Creek, at Tarradale, at a depth of about twelve feet from the surface, came upon a solid lump of gold, weighing 54 lbs., with about 80 ounces of smaller nuggets in close proximity. The total value taken from the claim was a little under 3000*l.*—The amount of gold issued by the Sydney branch of the Royal Mint, during the week ending the 6th June, 1856, was 20,000 half-sovereigns. The amount of gold-dust imported into the same establishment during the week, for the purpose of coinage, was 1698 ounces. The Western Escort arrived on the morning of the 6th of June, 1856, at the Colonial Treasury, and delivered the following quantities of gold-dust:—From Sofala, 372 oz. 15 dwts. 6 grs.; Tambaroora, 292 oz. 9 dwts.; Avisford, 447 oz. 11 dwts. 6 grs.; total, 1112 oz. 15 dwts. 12 grs.

With the discovery of gold, and the rapid increase of the population, the British government has introduced many social improvements and political regulations, which the altered state of things imperatively demanded.

In 1847 three colonial bishops were appointed to the following diocesan sees:—1. Diocese of Melbourne, for the district of Port Phillip, New S. Wales; 2. Diocese of Newcastle, for the northern counties of New S. Wales; 3. Diocese of Adelaide, S. Australia.

In 1851, a new constitution was conceded by the British parliament; and by the 13 & 14 Victoria, c. 59, it was enacted that the executive power of the colony should be vested in an executive council; usually consisting of the governor, the commander of the troops, the colonial secretary, the attorney and solicitor general, and a few minor functionaries. The legislative councils were to be partly nominated and partly elected by the crown, the elected members to represent districts, cities, and counties; and the right of electing to be regulated by certain conditions. The leading provisions of this constitution may be thus enumerated:—All legislative councillors to be British-born subjects, and to have a freehold qualification of 10,000*l.* value, or 1000*l.* per annum; while the qualification for election to the legislative council consists of a freehold of 1000*l.*, or 100*l.* annually, a leasehold of 300*l.* a year, or a degree in any British university, with a residence of twelve months in Victoria. Members of the House of Assembly must have freehold property of 2000*l.* value, or 100*l.* per annum. The qualification of an elector to be, a freehold of 5*l.* annual value, a leasehold of 10*l.*; the being a householder of a 10*l.* house, or a holder of a salary of 100*l.* per annum. The governors and legislative council are empowered to make laws, provided they are not repugnant to the laws of England, or interfere with the rights of the crown. These arrangements are manifestly formed on the model of the British constitution; the nominees of the crown being at the present time about one-third of the legislative assembly, and bearing some analogy to our House of Peers; they were intended to act as a check on the more democratical portion of the legislature. The two houses of legislation were recently opened by the governor in due form, agreeably to the provisions of the new constitution. Thus the colonists are in most respects self-governed, and general satisfaction appears to be the result.

The population of S. Australia, which in 1839 was 10,015, had increased, in 1848, to 38,666; and the population of the Australasian group, during the same years respectively, was 170,676 and 333,764. The imports in 1848, were 2,578,442*l.*; and the exports, 2,854,315*l.* In 1853, the population of the Australian continent was estimated at 590,000; of Van Dieman's Land at 73,000; and of New Zealand at 272,000. The number of emigrants amounted, in 1851, to 21,532; and in 1852, they had increased to 87,424. But the number of emigrants for 1856, and the consequent increase of population, is beyond all precedent.

According to accounts received during the present year (1857), the frightful depression of 1855 had entirely passed away; and the industrial and producing interests are making steady advances. Manufactories are springing up, not only in and about the capital, but also on the gold-fields, for the purpose of supplying articles which have hitherto been imported. Soap-works, candle-works, flour-mills, and breweries, are being established wherever consumption calls for them. Unskilled labour is what this colony chiefly demands, and for which there is the greatest certainty of employment. Husbandmen, navigators, and men accustomed to all the ruder forms of manual labour are finding occupation and remunerative wages. The supply of skilled labour is pretty nearly equal to the demand. Female domestics of good character, and willing to work in exchange for good wages, are in active request. Agriculture is rapidly increasing in every direction; and it is the difficulty of obtaining labour, and that alone, which appears to limit production in this country; although the Emigration Commissioners have ample funds at their disposal for giving free passages to suitable emigrants; and constant employment, at high wages, may be obtained on the day they land. It appears, also, that good agricultural land may be selected in the colony at the fixed price of one pound per acre, clear and fit for ploughing.

As to the price of provisions, which at one time had been frightfully high, they are now within reasonable compass. The following statement was recently given in the *Australian and New Zealand Gazette*, as the retail prices in the markets of Adelaide, to which the other districts are gradually assimilating:—Bread, 6*d.* the 2 lb. loaf; flour, 3½*d.* per lb.—Butcher's meat: mutton, 4*d.* to 6*d.* per lb.; lamb, 3*s.* 6*d.* to 4*s.* 6*d.* per quarter; beef, 4*d.* to 6*d.*; veal, 8*d.* to 1*s.*; pork, 1*s.* per lb.—Dairy produce: fresh butter, 2*s.*; salt ditto, 1*s.* 8*d.* to 1*s.* 10*d.* per lb.; eggs, 2*s.* to 2*s.* 3*d.* per dozen; colonial cheese, 1*s.*; English ditto, 2*s.*; Dutch ditto, 1*s.* 4*d.* per lb.; milk, 6*d.* to 8*d.* per quart; lard, 1*s.* 6*d.*; colonial bacon, 1*s.* 6*d.*; colonial hams, 1*s.* 6*d.* to 1*s.* 9*d.*; English ditto, 1*s.* 6*d.* per lb.; fowls, 7*s.* to 9*s.* per couple; pigeons, 3*s.* to 4*s.* per pair; turkeys, 15*s.* to 25*s.*; geese, 8*s.* to 12*s.* each; ducks, 8*s.*

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to 10*s.* per pair.—Vegetables: cabbages, 2*d.* to 6*d.* each, scarce; turnips, 6*d.* to 8*d.* per dozen; carrots, 3*d.* to 4*d.* per bunch; potatoes, 1*d.* to 1½*d.* per lb.; celery, 4*d.* to 1*s.* per head; green peas, 2*s.* 6*d.* to 3*s.* per peck; scarlet runners, 6*d.* per lb.—Colonial produce: flour, fine, 2000 lbs., new, 22*l.* to 23*l.*; seconds, 16*l.* to 17*l.*; wheat, new, per bushel of 60 lbs., 8*s.* 9*d.* to 8*s.* 10*d.*; barley, Cape, do. of 50 lbs., 5*s.* 6*d.*; English, do. of 50 lbs., 7*s.* 6*d.* to 7*s.* 9*d.*; oats, English, do. of 40 lbs., 5*s.* 3*d.* to 5*s.* 6*d.*; colonial, do. of 40 lbs., 5*s.* 3*d.* to 5*s.* 6*d.*; bran, do. of 20 lbs., 1*s.* to 1*s.* 1*d.*; pollard, do. of 20 lbs., 1*s.* to 1*s.* 3*d.*; hams, per lb., 1*s.* to 1*s.* 2*d.*; bacon, 1*s.* to 1*s.* 3*d.*; butter, salt, 1*s.* 4*d.* to 1*s.* 6*d.*; cheese, 10*d.* to 1*s.*; hay, per ton, in stack, 2*l.* 5*s.* to 3*l.*; tallow, per cwt., 2*l.* 10*s.* to 2*l.* 16*s.*; wool, per lb., first quality, 1*s.* to 1*s.* 3*d.*; do., second quality, 9*d.* to 1*s.*; third quality, 5*d.* to 9*d.*; copper, cake, &c., per ton, 110*l.*

The merino stock of sheep may be considered as the chief agricultural wealth of Australia; and we find that in January 1847 the total number had increased to 7,906,811, of which 2,996,992 belonged to the Victoria district, and 4,909,819 to the Sidney district. In 1848 the stock of the two districts had increased to 10,054,000. In 1852, the number of Australian sheep was estimated at 14,000,000; and so rapid has been the increase since that period, that we may now safely estimate them at upwards of 20,000,000. The exports of wool, in 1852, amounted to 43,197,301 lbs.

Continental Australia may now be classed under five distinct colonies, viz. Australia South, Australia West, Cooksland, or Moreton Bay, New South Wales, and Victoria, which, with their respective capitals, are fully described under their individual heads.

AUSTRIAN EMPIRE (ii. 516–35). The history and general state of this vast empire have been already brought down to the period of 1840 in our previous volumes; but since that time many important events and changes have taken place, which we shall briefly recapitulate.

The great changes which had occurred in France, after the expulsion of Louis Philippe, in 1848, fanned into a blaze the smouldering embers of popular discontent in Austria, when Prince Metternich, who for forty years had been the dominant ruler in that country, was expelled almost as rapidly as Louis Philippe from his throne. At the urgent demands of the people, the emperor thought it prudent shortly after to grant a constitution. For some period the affairs of state went quietly on; but on the 6th of October, 1848, a tremendous insurrection broke forth at Vienna. The troops appointed to march against the Hungarians, who were then in a state of rebellion, having communicated with the national guard and the academic legion, measures were taken to prevent their departure. The tide of insurrection having risen to an unconquerable height, the emperor and the other members of the imperial family left Vienna, and took the road towards Lintz. A determined attack, however, was at length made on the city by the

united forces of Prince Windischgratz and the Ban Jellachich; and it was eventually compelled to surrender. The academic legion was declared to be for ever dissolved. The national guard was disbanded, and all newspapers and clubs were suspended. Domiciliary visits were made to discover depôts of arms; and all persons not natives of the city were arrested. The diet was prorogued, and Prince Windischgratz declared it to be an illegal assembly. The deputies assembled on the previous day; but Prince Felix Schwartsenburg expelled them, and occupied the hall with troops. On the 2nd of December, 1848, the Emperor Ferdinand abdicated the imperial throne in favour of his nephew, the Archduke Francis Joseph, eldest son of the Archduke Francis Charles, who resigned his claims, as next brother to the Emperor Ferdinand, in favour of his son, now the Emperor Francis Joseph. The ex-emperor fixed upon Prague as his future place of residence. On the 7th of March, 1849, the young emperor issued the code of a new constitution, of an extremely liberal character; and on the same day he dissolved the assembly at Koremsin. By the various clauses of this constitutional code it was provided,—That every Austrian should enjoy full political and religious liberty. Every church and religious society recognised by law was to have the right of a common public exercise of its religion. The general education of the people was to be provided for by public institutions. The State was to have the supreme control over the affairs of instruction and education. Everybody was to have the right of a free expression of his opinions, by words, by writing, by print, and by drawings or paintings; and the press was not to be put under a censorship. These liberal concessions and changes did not, however, succeed in establishing tranquillity; but the whole empire was for a time involved in civil war, especially in Hungary, which continued to resist the imperial troops for some time, with every probability of success, until the assistance of Russia was called in, with an immense army, which, aided by the treachery of the Hungarian commander-in-chief, at length succeeded in reducing the Magyars to submission. [HUNGARY, *Suppl.*] The danger of the great crisis having thus passed away, the constitution was thought of no more. On the contrary, all the most offensive parts of the old régime were resumed, and the sword thenceforward became the only instrument of the government in all political matters.

On the commencement of hostilities, in 1854, between Russia and the Western Powers of Europe, in consequence of the Muscovite aggressions on Turkey, Austria was placed in a difficult position. She saw the necessity of checking the aggressive policy of Russia; but the ties of gratitude by which she was bound, for the important aid she had received in the subjugation of her own rebellious subjects, were sufficient to prevent any open act of hostility. Notwithstanding, she collected a large army in the Danubian Principalities, and was the means, in all probability, of compelling their evacuation by the Russians. She also entered into arrangements for the occupation

of those provinces during the continuance of the war; and made various attempts, by fruitless negotiations at Vienna, to effect a reconciliation between the belligerents. At length she succeeded, in 1856, in opening negotiations at Paris, which in the end led to a general peace. In the meantime she had entered into a concordat with the Pope of Rome, by which all her subjects were placed under the absolute hierarchal domination of the Romish priesthood. But what is to be the result of this melancholy prostration of all civil jurisdiction, time alone can unfold.

At the present time the Austrian empire is ecclesiastically divided into 15 archbishoprics, 76 bishoprics, 19 Protestant superintendencies, and 28,903 parishes, of which 19,503 are Roman Catholic. In 1851 there were 3,501,455 Protestants, 26,357,172 Roman Catholics, 6,856,701 Greeks, and 725,900 Jews. The Greek Catholics and the Protestants mostly inhabit the eastern provinces, and the Unitarians are nearly confined to Transylvania.

According to the census of 1850-1, the population of the principal divisions of the Austrian empire stood thus:—

Lower Austria	1,538,047
Upper Austria	706,316
Salzbourg	146,007
Styria	1,006,971
Carinthia and Carniola	783,180
Illyrian coast	508,016
Tyrol	859,706
Bohemia	4,409,900
Moravia	1,799,838
Silesia	438,586
Galicia	4,555,477
Bukowina and Dalmatia	780,541
Lombardy	2,725,740
Venice	2,291,732
Hungary	7,864,262
Volvodia and Servia	1,426,091
Croatia and Sclavonia	868,456
Transylvania	2,073,737
Military Frontier	1,009,109
Military	738,624

The population of the different races of the empire may be classified and divided thus:—

Sclavonians	16,500,000
Germans	6,700,000
Italians	6,700,000
Magyars (of Hungary, &c.)	5,900,000
Jews	641,000
Tartars	170,000
Gipsies	77,000
Armenians	22,100
Greeks	6,600
Illyrians	3,300
Total about	36,720,000

Notwithstanding the prevailing absolutism of the empire, education has made rapid progress of late years, which is chiefly owing to the stringency of the laws, that enforce the education of every child between the ages of six and twelve. No child is allowed to be sent into a factory before completing its ninth year; and after that age children are compelled to attend classes on Friday evenings and Sunday mornings, until they have attained their fifteenth year. In Roman Catholic countries the school inspector is the priest, and in Protestant districts the dissenting minister.

In railways, and other public works, Austria has made rapid advances. The first railway opened in Austria extends from Linz, on the Danube, N. to Budweis on the Moldau, and S. to Wells and Gmunden; but it is only worked by horse power. In 1854, the principal lines of railway were from Vienna to Gratz, and from Gratz, through Cilly, to Trieste; from Vienna N.W. to Stockeran, and E. to Brück; from Vienna N. to Brünn, and N. and N.W. to Olmutz and Prague. In Northern Italy, two grand trunk lines have been opened from Milan; one E. to Venice, and the other N. to Como. In Hungary there are two lines branching from Pesth, the one E. and the other N.

In 1847 the public debt of Austria was estimated at 99,000,000*l.*; and in 1853 her entire revenue amounted to 23,713,700*l.* annually.

AUTOM'ALITE (Gr. *αὐτόματος* extraneous, and *λίθος* a stone), a species of mineral; and a variety of the common corundum, or adamantine spar. It is of a dark green colour, and is found associated with lead-glance in talc. It contains a portion of zinc, and is the Spinelle zincifere of Hauy. Its crystals are regularly octahedral, or tetrahedral, with truncated angles; and its specific gravity is 4·1. Its component parts are—alumina, 60·00; silica, 4·76; oxide of zinc, 24·25; and oxide of iron, 9·25.

AYLMER, GENERAL LORD, a veteran soldier who was long engaged in the British service, in various parts of the world. The West Indies, the Low Countries, Germany, Copenhagen, and the Peninsula, were successively the scenes of his operations. At the passage of the Douro, the battle of Talavera, and other places of military celebrity, he particularly distinguished himself. In 1813 he commanded a brigade at Passages; and in the same year he undertook an expedition for the maintenance of the blockade of Santona. He held the appointment, in the Peninsula, of deputy adjutant-general of the British army; and after the war he was appointed adjutant-general to the forces in Ireland. He was subsequently appointed governor of Lower Canada. His death took place in 1851.

AYRSHIRE, in Scotland (ii. 581-7). According to the census of 1851, the entire population of this county was 189,858, with an area of 1,024,000 acres; of which 290,000 were under culture. The population of the principal places was as follows:—

Ayr	9,115
Ardrossan	5,581
Girvan	8,588
Irvine	7,534
Kilmarnock	21,443
Kilwinning ...pa.	6,359
—— ...bor.	3,265
Largs	3,715
Manchline	2,470
Maybole	7,715
Saltcoats	4,338
Stewarton	4,572
Troon	2,404

AZOFF, SEA OF (ii. 593). During the late war with Russia, the allied squadrons made several successful incursions into this inland sea. An expedition under Sir George Brown landed at Kertch, in May 1855; and after expelling the Russian garrison, and destroying great quantities of corn-stores and warlike material, took up a strong position in this Russian territory, which was maintained till the close of the war. At the same time the fleet passed the straits of Yenikale, and captured between two and three hundred Russian vessels, which had been employed in transporting supplies for the garrison of Sebastopol and the Russian army of observation. Later in the year further efforts were made to cripple the enemy in this quarter, and there can be little doubt that these measures entailed serious inconvenience upon the Russians. One of their principal depots was thus closed to them; and how to obtain the necessary supplies for their troops became a matter of serious difficulty for the Russian commanders.

B.

BABINGTON'S CONSPIRACY. Anthony Babington, a young gentleman of Derbyshire, instigated by John Ballard, a popish priest in 1586, entered into a conspiracy against the life of Queen Elizabeth. He was encouraged by Mary, Queen of Scots. The deliverance of Mary, and the re-establishment of the Roman Catholic religion, were the chief objects of this plot. Babington and thirteen others were executed. The conspiracy thoroughly alarmed Elizabeth, and induced her to bring her rival to trial.

BACHELOR'S BUTTONS, a term applied to the flowers of several plants; among the chief of which may be mentioned the *Ranunculus aconitifolius*, Natural order *Ranunculaceæ; the Ranunculus*, or Crowfoot tribe; the *Lychnis diurna*, variety *Vespertina*, White Campion, or Cuckoo flower; Natural order *Caryophillaceæ*, the Clove wort tribe; the double variety of the *Achillea ptarmica*, Sneezewort yarrow, or Goosetongue. The Natural order *Compositæ*, Composites, is also sometimes called *Bachelor's buttons*. It is a term very generally applied to several other flowers.

BADEN, GRAND DUCHY OF (ii. 652-7). According to the census of 1852, the sub-divisions, area, and population of the Duchy were returned as follow: —

Circles.	Sq. M.	Pop.	Chief Towns.
Lake Constance	1,303	199,075	Constance
Upper Rhine	1,654	349,205	Freiburg
Middle Rhine	1,633	462,035	Carlsruhe
Lower Rhine	1,314	346,578	Mannheim
Total	5,904	1,356,943	

Of the above returns there were 905,143 Roman Catholics; 432,184 Protestants; 479 Dissenters; 1,421 Mennonites; and 23,547 Jews. The public revenue, in 1852, amounted to 19,536,497 fl.; and the expenditure was 19,545,723 fl. Baden holds the seventh place in the German confederacy, and has three votes in the full council. Her regular army consists of 15,000 men; and her contribution to the confederate army is 10,000 men.

BAEL-FIRE (i. 604), a term in use among our Saxon ancestors, as applicable to the fire by which the dead were burnt. The custom of burning the dead is known to have prevailed among the northern nations of antiquity, as well as among the Greeks and Romans. Among the Caledonians and ancient Scandinavians, the words *baal* and *bael*, denoted a funeral pile, or the blaze thence arising. Hence, in all probability, arose the term. Bael-fire was also applied, among the Saxons, to the capital punishment of burning.

BAILLIE, JOANNA, one of the most distinguished female writers of Great Britain, especially as a dramatist and a poetess. She belonged, as it were, to a family in which genius and literary talent were hereditary. Her father was professor of divinity in the University of Glasgow, and her mother was the sister of the celebrated anatomists William and John Hunter. Her brother was Dr. Matthew Baillie, who succeeded his uncle Dr. Hunter, as lecturer of anatomy at St. George's Hospital, and whose professional practice was so extensive, as to realize an income of 10,000*l.* per annum (see vol. ii. p. 694). Miss Baillie had also a maiden sister, Agnes, who was a poetess, to whom she addressed her beautiful birth-day poem.

Our fair authoress was born about the year 1765, at Bothwell, in Lanarkshire,—a place celebrated for its historical reminiscences. At a very early age she manifested a predilection for literature, and especially for poesy and the drama. In 1798 her first dramatic efforts made their appearance under the title of 'A Series of Plays,' in which the stronger passions of the mind were attempted to be delineated; each passion being the subject of a comedy or a tragedy. In 1802 she brought out a second volume; and in 1812 a third, which largely contributed to her literary reputation. Her pen, however, was not entirely confined to these productions; for during the interval of the two preceding publications she presented to the world a volume of miscellaneous dramas, which called forth the favourable notice

of Sir Walter Scott and other distinguished literates of the day. The 'Family Legend,' which appears in this collection, was a tragedy founded upon the story of one of the MacLeans of Appin, and which, through the influence of Sir Walter Scott, was brought out on the Edinburgh stage. In 1808 she paid a visit to Sir Walter, and in the following year her tragedy was played for fourteen nights with great success. In 1814 it was brought out on the London boards, and was favourably received. Her only play of 'The Passions' ever represented on the stage was 'De Montfort,' which was acted for eleven nights under the management of John Kemble. In 1821 it was revived for Edmund Kean, when Miss O'Neill played the heroine; but the attempt was not attended with success. In truth, like Dr. Johnson's 'Irene,' it was more of a poem than a drama. Like all Miss Baillie's dramatic efforts, it was full of genius and the true spirit of poesy, but it was not strictly a play; and therefore not destined for perenniality. In 1823 a collection of poetic miscellanies made their appearance, under her name, which contained Scott's dramatic sketch of 'Macduff's Cross,' with some of Mrs. Hemans' poetry. In 1836 our fair authoress published three more volumes of plays. Her literary fame at this period may be considered as fairly established; but, notwithstanding, she always lived in retirement at her retreat at Hampstead; though constantly visited by Sir Walter Scott when in town, who always continued to express his enthusiastic admiration of her talents and genius. In fact she was never induced to enter generally into society, but passed the latter portion of her life entirely with her maiden sister. Her death took place in 1850.

BAINES, EDWARD, author of 'The History of George III.' He was born in 1774, and was originally a printer at Leeds; but was returned to the reformed parliament, in 1833, where he served for seven years, and distinguished himself as a friend and supporter of civil and religious liberty. He died in 1848.

BAIN'S ELECTRIC CLOCK. [ELECTRIC CLOCK.]

BAKING POWDER, is a composition made use of in the manufacture of some kinds of unfermented bread. It generally consists of a carbonated alkali and an acid, mixed with arrowroot, or rice starch. On the addition of water to flour containing these powders, the acid decomposes the carbonated alkali, and sets free the carbonic acid, which gas gives the peculiar porosity and lightness to the bread.

The following are two receipts for powders of this description:—

Tartaric acid	8 oz.
Dry bicarbonate of soda	9 oz.
Arrowroot, or rice flour	10 oz.

Egg Powder.

Bicarbonate of soda	25 lbs.
Tartaric acid	15 lbs.
Potato flour	56 lbs.
Turmeric powder	6 oz.

Patent unfermented bread is a preparation produced on a similar principle; and the following is an excellent receipt for its manufacture, given in Pereira's 'Materia Medica:'—

Flour	1 lb.
Bicarbonate of soda	40 grs.
Cold water, half a pint, or a sufficient quantity.	
Hydrochloric acid	50 drops.
Powdered sugar, a tea spoonful.	

'Mix the soda and sugar with the flour in a basin with a wooden spoon; then gradually add the water, the acid having been previously mixed with it, and form an intimate mixture as quickly as possible. Divide into two loaves and bake. If the soda escapes the action of the acid it causes one or two yellow spots, which are, however, more unsightly than detrimental.'

When hydrochloric acid is made use of it is better to employ the *Pure*, as the common of the shops generally contains minute quantities of arsenic.

Some kinds of biscuits are made with Sesquicarbonate of Ammonia, as the agent for producing this lightness. When heated, this salt volatilizes, and distends the dough, giving the lightness and porosity above spoken of.

BAKTCHISSARIA (ii. 709). This town is now generally written Baktcheserai, its name signifying 'Seraglio of Gardens.' It is situated in the Crimea, about eighteen miles S.W. of Simferopol. The population, mostly Tartars, amounts to 15,000.

BALACLAVA (ii. 711). Recent events in the Crimea, and its occupation by the English, have raised this small place into sudden importance. Our army entered the town on the 26th of September, 1854, and found Sir E. Lyons awaiting their arrival with a portion of the fleet. The place was speedily captured, and our splendid steamers threaded their way through rocks and precipices into the narrow haven of Balaclava. Mr. Russell, the *Times' Correspondent*, thus describes this extraordinary harbour:—'He was a bold mariner who first ventured in here, and keen-eyed too. I never was more astonished in my life than when I halted on the top of one of the numerous hills, of which this portion of the Crimea is composed, and looking down, saw under my feet a little pond, closely compressed by the sides of high rocky mountains. On it floated some six or seven English ships, for which exit seemed quite hopeless. The bay is like a highland tarn, and it is long ere the eye admits that it is some half mile in length from the sea, and varies from 250 to 120 yards in breadth. The shores are so steep and precipitous that they shut out, as it were, the expanse of the harbour, and make it appear much smaller than it really is. Towards the sea the cliffs close up, and completely overlap the narrow channel which leads to the haven; so that it is quite invisible. On the south-east of the poor village, which struggles for existence between the base of the rocky hills and the margin of the sea, there are the extensive ruins of a Genoese fort, built some two hundred feet above

the level of the sea. It must have once been a large and important position; and its curtains, bastions, towers, and walls, all destroyed and crumbling in decay though they are, evince the spirit and enterprise of the hardy seamen who penetrated these classic recesses so long ago. There may be doubts whether the Genoese built it; but there can be none that it is very old, and superior in workmanship to the edifices of the Turks or Tartars. The town of Balaclava is approached in this direction through a narrow defile, leading from the more open country about Traktir. It is a formidable pass, and a few resolute men posted here might occasion great trouble, even to a great army; but we were permitted to go through without let or hindrance of any kind.'

In 1854 the English Expeditionary Army established themselves in this place, improved the harbour, built quays, constructed quite a new town, with store-houses, hospitals, &c., and laid down a line of railroad to the camp, about seven miles distant. On the signature of the treaty of Paris, in 1856, preparations were made for restoring Balaclava to the Russians, and in the course of the summer the last soldier had embarked.

(Russell's *Letters on the War.*)

BALACLAVA, BATTLE OF. Soon after the occupation of the Crimea by the Allied armies the Russian garrison at Sebastopol received a reinforcement of about 50,000 men, under Liprandi. This enabled their generals, early on the 25th of October 1854, to send out a strong body of Russian horse, supported by infantry and artillery, to attack what was considered a weak point of the English position. It was a range of low hills facing the Tchernaya, upon four of which the Turks had constructed earthen redoubts, each being armed with two or three guns. The Turks were speedily expelled from these defences, and took refuge on the flanks of the 93rd Highlanders, hastily drawn up by Sir Colin Campbell. These brave fellows received the Russian horse, without changing their formation, and by their coolness and steady gallantry completely routed them. Thereupon the Russian cavalry retired into the valley, where they were charged by a small force of the Scots Greys and the Enniskillen Dragoons. These were joined by the 1st Royals and the 4th and 5th Dragoons, and in a short space of time 400 English cavalry dispersed a Russian corps three times more numerous. The heavy cavalry had nobly maintained their share of the day's proceedings, and at soon became the turn of the Light Brigade to achieve glory and renown. On its defeat, the Russian horse, with the infantry and artillery, retired down the valley towards the entrance of the gorge. Six battalions of infantry, protected by thirty guns, were drawn up in this position; and the hills at the side were covered with Russian infantry. At this juncture Lord Lucan received the memorable order from Lord Raglan, which, together with Captain Nolan's remarks, induced him to send word to Lord Cardigan to lead forth the Light Brigade to what seemed certain destruction. Upon that fearful exploit they advanced 670 strong. They had to charge an army in position, protected by a powerful artillery. When about twelve hundred yards from the foe, the Russian batteries poured forth a murderous volley, and many a gallant fellow was laid low. Nevertheless the survivors dashed on, cut down the artillerymen at the guns, and drove back the infantry. A corps of lancers was hurled upon their flank, and to their eternal disgrace the Russian artillerymen opened fire on friend and foe now engaged in a deadly struggle. The heavy cavalry came forward to cover their retreat; the French *Chasseurs d'Afrique* executed a brilliant charge on a battery on the left; and thus the remnant of the Light Brigade escaped. The affair lasted twenty minutes, in which time 400 men and nearly the same number of horses were destroyed. But the moral effect of the victory was wonderful, and the Russians dreaded an encounter with such troops.

(Russell's *Letters on the War;* Dr. Russell's *History of Modern Europe.*)

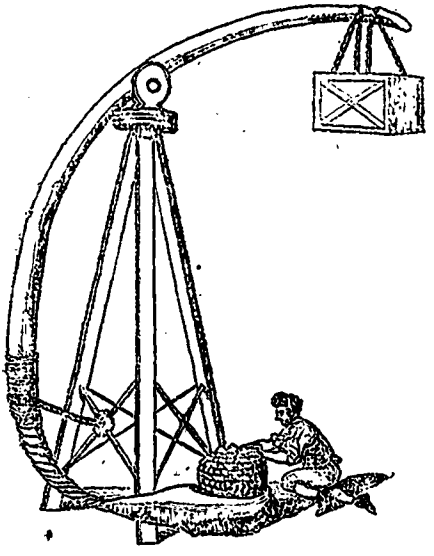
BALITO'RA (Gr. *βαλιός* spotted), a genus of fishes, allied to the Cobitidæ, of which it forms the cartilaginous or platyrostral type. The head and body are depressed, the scales large and tenacious, the dorsal fin is small and central, and the pectoral fins large and rounded; the mouth is small, and placed beneath the throat.

BALKAN (ii. 739), PASSAGE OF THE. Soon after the accession of Nicholas to the throne of Russia he made preparations to attack the Porte, and early in 1828 war was declared. Diebitch led the Russian armies across the Balkan range in July 1829; and, although his troops were in a terrible condition, by bribery and intimidation he obtained possession of Adrianople. In this extremity the Porte signed the disastrous treaty of Adrianople.

BALL AND SOCKET, a brass instrument with a perpetual screw, so contrived as to move horizontally, vertically, or obliquely. It is used for astronomical and other instruments; and is of great advantage in gauging, surveying, and making observations of every kind.

BALLISTA (Gr. *βάλλω* to throw, or Latin *ballista* a cross-bow), a military engine in use among the ancients for casting projectiles. It was formed on the principle of the cross-bow, but much more powerful, of which frequent notices will be found in 'Cæsar's Commentaries,' and other works of the Greek and Roman historians. It has been described as a large beam, rather crooked, resting at about two-thirds of its length on a forked support. At the long end was a large pear-shaped bag, tied to the beam by a strong rope. At the short end was a large box full of stones, the long end being suddenly released, slung the contents of the bag on the enemy, through being jerked up by the great weight of the stone box, as represented in the annexed drawing. (No. 1, p. 113.)

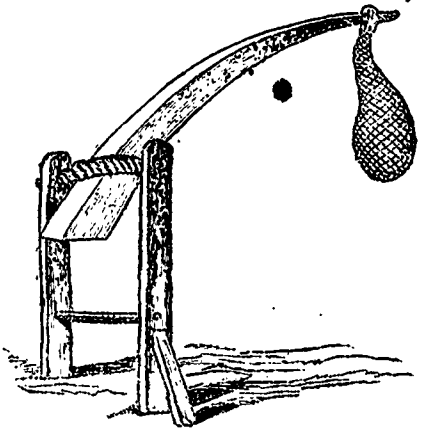
This machine was used in besieging cities, not only for throwing stones, but sometimes also for casting darts and javelins. Marcellinus describes a ballista intended for casting darts, &c., as a round iron cylinder fastened between two planks, from which reached a hollow square beam placed



BALLISTA, NO. 1.

crossways, fastened with cords, to which were added screws. At one end of this stood the engineer, who put a wooden shaft with a large head into the cavity of the beam. This done, two men bent the engine by drawing some wheels. When the top of the head was drawn to the utmost end of the cords, the shaft was driven out of the ballista.

There was another kind of ballista, called the *Onager*, which threw a bag of stones; but there was no stone box like the one just described,—the beam being impelled by its position between twisted ropes, which were always inclined to recoil.



BALLISTA, NO. 2; OR ONAGER.

The *Manu-ballista*, or *cross-bow*, was introduced into Europe by the Crusaders, though it was known in England, at least for the chase as early as the Conquest; and Richard I. applied

it to military purposes. In the reign of Edward I. the Earl of Warwick (says Strutt) had in his army a number of soldiers called Ballistarii, which may be translated slingers, or casters of stones, who frequently formed a part of the Anglo-Norman armies. In fact the cross-bow itself was adapted to the purpose of throwing stones; and, on this account, was sometimes called a Stone-bow; hence the appellations Ballistarius and Arcuballistarius were often applied to the same person.

(Cæsar's *Bell. Gall.*; Marcellinus's *Hist. Rom.*; Grose's *Mil. Antiq.*; Meyrick's *Ancient Armour.*)

BALLS, in military matters, a general term applied to every kind of spherical shot, fired from a musket, rifle, or cannon. Those for muskets and pistols are made of lead, and cannon-balls of iron; their sizes and weights being distinguished by their calibres. In the military art, there are various kinds of *light*-balls, *smoke*-balls, *fire*-balls, &c., which are used in sieges. *Light-balls* are either spherical or oblong, and are of great use in discovering the working parties of the besiegers by the strong light they throw on distant objects. They are made of pulverized gunpowder, nitre, brimstone, camphor, and borax, moulded in a mass, and wrapped up in tow, with a sheet of strong paper enveloping the whole. The *fire-balls* are bags of canvas filled with combustibles, thrown out of mortars to fire houses, magazines, &c. *Smoke-balls* are also fired from mortars, and continue to smoke for about half-an-hour after being discharged. They are intended to prevent their position being discovered; or, on the other hand, to cause annoyance to the enemy. They are made of melted rosin, nitre, sulphur, and charcoal. *Sky-balls* are those which, being cast out of mortars, ascend to a great height, and burst like rockets. They are useful in showing the situation of forts or lofty buildings which are about to be attacked. *Stink-balls* are intended to stifle an enemy, or drive him out of his stronghold. They are composed of pitch, rosin, nitre, gunpowder, colophony, charcoal, horn-parings, assafœtida, and other offensive materials.

BALM OF GILEAD is an oleo-resinous liquid, procured from a small evergreen tree growing on the Asiatic and African shores of the Red Sea. It belongs to the Natural order *Amyridaceæ*, and is the *Balsamodendron gileadense* of Kunth, and the *Amyris gileadensis* of Linnæus. The balm is obtained by incision of the bark, and has a high value, owing to the small quantity produced. It is stated that it is seldom obtained at a greater rate than three or four drops per day from a branch, and that the most resinous trees rarely produce more than 60. None of this, it is said, reaches this country; that which is occasionally seen here being obtained by decoction of the branches and leaves in water. It is described as a thick, turbid, whitish, odorous liquid, which solidifies, and becomes yellow by exposure. It is the *Balm* mentioned in the Old Testament, and is also termed *Opobalsamum*, Balsam of Gilead, and Balsam of Mecca. The dried twigs of the tree were formerly called

Xylobalsamum, and the dried fruit *Carpobalsamum*.

The most wonderful properties were formerly ascribed to this balm, and it is still held in high estimation among Eastern nations, who employ it both as a medicine and cosmetic. It is believed to be similar to other liquid turpentines in its physiological effects, and is adapted to the same cases, but is seldom or never employed by Europeans. The Asiatics use it for its odoriferous as well as its medicinal qualities. Mention of it is made in the following places in the Old Testament. Genesis xxxvii. 25; where the Ishmaelites were carrying 'spicery *balm* and myrrh' into Egypt on camels. Genesis xliii. 11; where Jacob directs his sons to take, amongst other presents, '*a little balm*' to Joseph in Egypt. Jeremiah viii. 22; where the prophet exclaims, 'Is there *no balm in Gilead*?' &c. Jeremiah xlvi. 11; 'Go up into *Gilead*, and take *balm*.' Jeremiah li. 8; where, speaking of the fall of Babylon, the prophet says, 'Take *balm* for her pain.' Ezekiel xxvii. 17; where the children of Israel and Judah are spoken of, as 'merchants trading in wheat, honey, oil, and *balm*.'

A proprietary medicine, sold under the name of Solomon's Balm of Gilead, appears to be a tincture made with brandy; one of the chief ingredients being cardamoms. Some have asserted that it also contains cantharides.

BALMORAL CASTLE. This royal residence is situated on the right bank of the river Dee, in a romantic part of the Highlands, about forty-four miles from Aberdeen. The mansion consists of a centre, square and lofty, with two wings. The apartments are spacious, and the views beautiful and romantic. The Queen selected this as a royal residence in September 1848, and has since that period spent a few weeks of each autumn in this retreat. Until 1851 the castle and domain of Balmoral were only rented by the Queen. In that year the estate, seven miles in length and four in breadth, was purchased by the Royal family. (*Annual Register*, &c.)

BAL'NEUM (Lat.), literally signifies a bath, or a receptacle for the bathing of the body; but among chemists it signifies a vessel filled with some matter, as sand, water, &c., in which another is placed, requiring a more gentle heat than the naked fire.

BALSAM CANADA, an oleo-resin, yielded by the *Abies balsamea*, Lindley; *Pinus balsamea*, Linnæus; *the Balm of Gilead*, or Canadian balsam Firs; and a member of the natural order *Pinaceæ*, the Pine Tribe. This tree is an inhabitant of several parts of North America. It seldom grows to a greater height than 40 feet. Its cones are of a purplish hue, and are frequently covered with exuded turpentine; and these, with the peculiar comb-like arrangement of the foliage, produce a very beautiful and elegant effect. The balsam is obtained by means of incisions made into the body of the tree. It is sometimes called 'Balm of Gilead,' from its supposed resemblance to that celebrated medicine.

BALSAMA'CEÆ, or BALSAMIFLUÆ (*balsam*, and Lat. *fluo* to flow), a natural order of exogenous plants, which consists of lofty trees, flowing with balsamic juices. In their properties they are intermediate between the plane and the willow. They bear their flowers in small scaly heads, without either calyx or corolla, having the stamens in one kind of head and the pistils in another. This order contains but one genus, the liquid-amber.

BALTA-LIMAN, CONVENTION OF, an Act signed between Russia and Turkey, at Balta-Liman, on the first of May, 1849, for the regulation of the principalities of Moldavia and Wallachia. Although these provinces were by this convention nominally placed under the sovereignty of the Porte, the Emperor of Russia managed to make it the instrument of an unjust and dangerous kind of interference. — (*Parliamentary Papers.*)

BALTIC SEA (ii. 759), OPERATIONS IN THE, DURING THE RUSSIAN WAR. It has long been the aim of the Russian Emperors to convert the Baltic Sea into a Russian lake. Accordingly, on the outbreak of the late war, the allied powers sent a fleet into that inland sea. In the spring of 1854 Sir Charles Napier took the command of the English portion of the expedition to the Baltic. The first division consisted of seventeen ships, most of them propelled by steam. They were afterwards joined by the second squadron under Admiral Corry, and the French fleet commanded by Admiral Parseval-Deschênes. They captured several merchantmen, blockaded the Russian ports, and kept the Russian ships-of-war closely imprisoned behind formidable batteries. In August a French expeditionary force, of 10,000 men, was sent out to the fleet in English ships. With this, the formidable fortress of Bomarsund—the capital of the Aland Isles—was attacked. General Bodisco surrendered on the 16th of August, when 2235 prisoners, and a quantity of stores, ammunition, and guns fell into the hands of the victors. This achievement brought the Baltic campaign of 1854 to a termination, and by the end of the year all the allied vessels had returned to their respective stations, or were on their way home. The command of the Baltic fleet, in the second campaign of 1855, was entrusted to Rear-Admiral Richard Saunders Dundas. A considerable improvement had been made upon the armament of the former year. Several gun and mortar-boats, and floating batteries, tended to increase its efficiency. The main body of the fleet sailed on the 4th of April, and was joined, on the 1st of June, by a small French squadron under Admiral Penaud. Several infernal machines were taken up by the crews, without having caused any damage. The two principal matters in this campaign, the Hango massacre and the bombardment of Sweaborg, will be noticed in another part of this work. The blockade was strictly maintained, and before Christmas all the fleet had quitted the northern waters.

(Russell's *History of Modern Europe*; new edition; published by George Routledge and Co.)

BALTIMORE, U.S. (ii. 761-2). The population of this city, like all the great towns of the

United States, has of late years been amazingly progressive. In 1790 it only contained a population of 13,503; in 1800, 26,514; in 1810, 35,583; in 1820, 62,738; in 1830, 80,625; in 1840, 102,313; in 1850, 169,054; and in 1854, 200,000, including the environs. It has now become the third city in the States, for population and commerce; and its railroads run to Washington, 38 miles distance; to Philadelphia, 98 miles; to New York, 186 miles; and to Pittsburg, and Charleston, 590 miles. Its commerce is extensively and rapidly increasing. The receipts for the year ending 1853 were amazing. Among other commodities there were 3,411,965 bushels of wheat, 3,906,494 bushels of corn, 780,000 bushels of oats, 160,000 bushels of rye, 406,000 tons of Cumberland, and 183,000 tons of Anthracite coal, 35,003 bales of cotton, and 83,000,000 feet of lumber. There were also imported 208,702 bags of coffee; 3,820 hogsheads of molasses; 12,582 hogsheads, and 14,350 barrels of sugar; 900,000 of wool and hides, valued at 137,690 dollars. There were 356 American vessels cleared from the port, and 227 foreign ones. In 1853 there were twelve banks with an aggregate capital of 7,292,315 dollars, a savings bank, and eight insurance offices. There were also 20 printing offices, issuing five daily newspapers; four, three times a week; eight weekly papers; and four monthly publications. In 1850 there were 2,243 industrial establishments, in which was invested a capital of 6,541,922 dollars; which gave employment to 15,442 male, and 5,044 female artisans.

BALZAC, HONORE DE, late editor of the 'Revue Parisienne,' and one of the most prolific and distinguished novelists of modern times. He was born at Tours in 1799, and educated at Vendôme. He commenced his literary career as an anonymous writer; and between the years 1821 and 1829 published a great number of volumes, under various pseudonymes, with but limited success. At length he was induced to put forth all his powers under his own name; and with what success, his 'La Peau de Chagrin,' 'Les Chouans,' 'La Physiologie de Mariage,' 'Le Père Goriot,' and 'La Femme de Trente Ans,' bear ample testimony. His productions afterwards succeeded each other with wonderful rapidity; and with his advancing years, it may be said, he grew in literary strength, for his latest works, the 'Medecin de Campagne' and his 'Parens Pauvres,' may be classed among the very best of his productions. Although the romances of Balzac exhibit the highest evidence of his imaginative powers, still he did not confine his talents to this walk of literature, for independently of being the active editor of the 'Revue Parisienne,' he wrote some dramatic pieces, which were well received by the theatrical public. In 1848 occurs an interesting and romantic incident in his life. He had long entertained a deep but apparently hopeless passion for a Russian princess; and this year she compensated him for many years of untiring devotion by the gift of her hand. After this period our author was engaged in visiting the battle-fields of Germany and Russia, and in collecting materials for a series of volumes, to be published under the title of 'Scènes de la Vie Militaire.' But death terminated his career in 1850.

BAN'DOLINE, also termed *Fixature*, or *Clysphitique*, is a compound made use of by ladies for stiffening and preserving the form of their hair. It usually consists of a thick mucilage of the Carageen, or Irish moss, *Chondrus Crispus*, Natural order *Algæ*, Algals; or it is formed with a thick mucilage of the seeds of the common quince, *Cydonia vulgaris;* Natural order *Pomaceæ*, Appleworts; scented with eau de Cologne, or some other prepared spirit. A gum called Tragacanth, the produce of the *Astragalus vêrus*, Natural order *Fabaceæ;* the *Bean tribe* is also used by some; whilst others employ Spermaceti or wax melted in castor or almond oil, and sometimes the addition of a little tincture of mastic. Any perfume is added, in accordance with taste.

BANDORE (Span. *bandarria*), a kind of lute which was introduced into this country in the reign of Queen Elizabeth. It was like the Grecian instrument *bandoma*, which had three strings, and is mentioned in the catalogue of collections made by Charles I.

BANE-BERRIES, the fruit of the '*Actæa Spicata*,' or Herb Christopher; a native of the woods of mountainous regions in Europe. It is a perennial herbaceous plant, growing to the height of two feet or more, and belonging to the natural order *Ranunculaceæ*, the Ranunculus, or Crowfoot tribe. It is found in woods and shady places in Yorkshire, Essex, and other counties in England. The root is of a dark brown colour, having a sweetish rather nauseous odour, which is, in a great measure, dissipated by drying; and a somewhat acrid bitterish taste. It bears some resemblance to that of the *Helleborus niger*, Black Hellebore, or Christmas rose, and is said to be sometimes substituted for it. Its physiological effects are purgative, and sometimes emetic. It is said to have been found useful in some nervous cases, but requires caution in administering, as it is capable of producing dangerous effects, in over doses. The berries are poisonous in a very high degree, and the juice of them affords a deep black dye. Toads are said to be attracted by the fetid odour of the plant. Be this as it may, it usually grows in such damp and shady places as these reptiles delight to resort to.

The term *Bane-berry*, applied to different species of Actæa, is obviously derived from the poisonous nature of their fruit.

BANEWORT, the *Atropa belladonna*, or deadly nightshade, a poisonous plant, with a herbaceous stem, found growing in hedges and waste ground, and known by the name of Common Dwale. Its leaves are ovate and undivided, its flowers solitary, with a five-cleft campanulate calyx and campanulate corolla; the berry is globose, and seated in the calyx.

BANFFSHIRE, in Scotland (ii. 789). According to the census of 1851, the entire population of the county was 54,171, and that of the principal towns was as follows:—

Banff	4,426	Portsay ...	2,062
Cullen ... ...t.	3,165	Portgordon	457
——— ... bor.	1,696	Buckie ...	2,789
Keith	4986	Macduff ...	2,527

BANIM, JOHN, an Irish writer and novelist of some celebrity, whose numerous works have been very extensively read by all who take an interest in the social condition of the sister kingdom. He was born at Kilkenny in 1800. Early in life he gave indication of poetical and literary talent; and when only seventeen years of age he became editor of the 'Kilkenny Journal.' The following year he attracted attention by the publication of his melo-drama of 'Damon and Pythias;' and at twenty he became editor of the 'Literary Register.' His real fame, however, commenced with the production of his 'O'Hara Tales,' in 1825. In these he was the first to depart from the path chosen by Miss Edgeworth and Lady Morgan, and to exhibit the crime, the passion, and the tragedy of the Irish cottage in all their dark characters. These tales were followed in rapid succession by 'Boyne Water,' 'The Croppy,' 'The Denounced,' 'The Smuggler,' 'The Mayor of Windcap,' and others of a national character. With all this popularity, however, he appears to have derived but a precarious subsistence from his works; for he was compelled, in his latter days, to depend on the bounty of his friends, although he was in the enjoyment of a small pension from Government, which saved him from absolute penury.

BANK OF ENGLAND (ii. 790–5). This extensive range of buildings occupies several acres of ground; and although, as a specimen of architecture, it is not very striking, still for its general commodiousness and vast importance it justly ranks as the first establishment in Europe. Its exterior in every way corresponds to the idea of strength and security, although it is wanting in uniformity of design, owing perhaps to its having been erected at different periods by different architects. It is very conveniently located in proximity to the Royal Exchange, and in the great commercial centre of London. Its front is composed of a central façade, of the Ionic order, 80 feet in length, resting on a rustic base, and of two wings ornamented with a colonnade. On the east side of the principal entrance from Threadneedle Street, is a passage leading to a spacious apartment called the Rotunda, where the business of the public funds is chiefly transacted. The back of the building in Lothbury is a high and heavy wall of stone, where there is a large gateway entrance for carriages into the great court for the reception of bullion. In the interior there are numerous apartments for the transaction of every kind of business connected with the financial management of the bank, and especially of the national debt. Branching from the great Rotunda are various offices appropriated to the management of particular stocks. In each of these, under the respective letters of the alphabet, the books are arranged, in which the name of every fundholder and the amount of his stock, are duly registered. There is also the great hall for the issue and exchange of bank-notes, which is 79 feet by 40, and contains a very fine marble statue of William III. the founder of the bank. The business of late years having so materially increased, has rendered considerable enlargements of the offices in every department absolutely necessary, and the number of clerks and officials may be said to have quintupled in the course of a very few years.

BANKS, JOINT STOCK (ii. 795-8). The annexed summary will show the relative capitals, extent of transactions, profits, &c., of the leading joint stock banking establishments in London, during the six months preceding the half-yearly meetings of the present year (1857).

At the Bank of England the private deposits had increased from 9,810,045*l.* to 10,132,655*l.*—Of the London and Westminster Bank, the capital was 1,000,000*l.*; the deposits, 11,438,461*l.*; guaranteed fund, 150,000*l.*; dividend, 17 per cent.; established 1834; six branches.—London Joint Stock; capital 600,000*l.*; deposits, 7,224,527*l.*; guaranteed fund, 165,932*l.*; dividend, 25½ per cent.; established 1836; one branch.—Union of London; capital, 600,000*l.*; guaranteed fund, 135,000*l.*; dividend, 15 per cent.; established 1839; three branches.—London and County; capital, 498,032*l.*; deposits, 3,543,824*l.*; guaranteed fund, 100,000*l.*; dividend, 11 per cent.; established 1839; sixty-two branches.—Commercial; capital, 300,000*l.*; guaranteed fund, 70,821*l.*; dividend, 7 per cent.; established 1840; one branch.—Bank of London; capital, 300,000*l.*; deposits, 1,256,624*l.*; guaranteed fund, 8000*l.*; dividend, 5 per cent.; established 1855; one branch.—City Bank; capital, 225,000*l.*; deposits, 9,444,475*l.*; guaranteed fund, 10,000*l.*; dividend, 5 per cent.; established 1855; no branches. The Union and Commercial Banks do not publish any detailed accounts, and their present deposits cannot be stated.

BANKS, THOMAS CHRISTOPHER, law genealogist and antiquary. He was born in 1766, and educated for the law. Having acquired a certain degree of celebrity by the publication of some works connected with genealogical subjects, he was employed to conduct different claims for dormant peerages. Among these were claims to the viscountcy of Montagu, the barony of Leigh of Stoneleigh, and the earldom of Stirling; but in all of these he appears to have been unsuccessful. Indeed in some of them he seems to have been the dupe of his own devices. Still many of his literary works have considerable merit. His 'Manual of Nobility,' which he published in 1807, contains a very clear description, not only of the peerage, but of the great officers of state, and of His Majesty's household. During the years 1807, 1808, and 1809, he published three volumes of his 'Dormant and Extinct Peerages,' and another volume in 1812. In 1814 he published 'An Historical and Critical Inquiry into the Nature of the Kingly Office, the Coronation, and the Office of King's Champion,' and in 1816, 'A History of the Ancient Noble Family of Marmyun, their singular Office of King's Champion, and their Services of London, Oxford, &c. on the Coronation Day.' He was

also the compiler of a great portion of the cases furnished by Lewis Dymoke, on his claim to the barony of Marmion, in right of the tenure of the manor of Scrivelsley, co. Lincoln, between 1814 and 1817. In truth, Mr. Banks was one of the most indefatigable genealogical writers of the day. His 'Stemmata Anglicana,' published in 1825, and his 'Genealogical and Historical Account of the Ancient Earldom of Salisbury,' are sufficient evidence of this; although his claim for the right of Baron Audley to the earldom of Salisbury was shown, by Mr. Beltz, to be purely imaginary.

In his latter years Mr. Banks went to reside near Ripon, in Yorkshire, and there employed himself in a fresh arrangement of his collections on the peerage, which he subsequently published under the title of 'Baronia Anglica Concentrata.' He afterwards took up his abode at Greenwich, where he resided at the time of his death in 1855. During his life he assumed the title of 'Baronet of Nova Scotia, and Knight of the holy order of St. John of Jerusalem;' but the right to these titles was never substantiated.

BANSHEE, or BENSHI. In the legendary history of Ireland, and also of Scotland, this was the name of a fairy, formerly believed to appear in the shape of a diminutive old woman, and to chant, in a mournful ditty, under the windows of the house, the approaching death of some one belonging to the family of any great personage. In Scotland, the Benshi was called the fairy's wife, who was alike zealous in giving intimation of approaching death.

BA'PHIA (Gr. *βάφη* a dye), a genus of plants, the wood of which is imported into this country from Sierra Leone, as a dye stuff, under the name of Cam-wood. It is of the natural order of Leguminosæ, and consists only of one species, *B. nitida*, which the cabinet-makers call ring-wood.

BAR'ATHRON, or BAR'ATHRUM (Gr. *βάραθρον* a deep fosse), a dreadful plan of punishment used by the Athenians. It consisted of a deep and dark dungeon, with sharp spikes at the top to prevent the escape of the criminals, and others at the bottom to lacerate their bodies. From the depth and capaciousness of these dungeons the word has been applied as a fit emblem for a crafty glutton, or insatiable miser, or to a deep hole for the concealment of treasures.

BARCELONA, in Spain (ii. 847-50). The population of the province, in 1849, was 533,695; and of the city, 120,000.

BARDESA'NISTS, an early Christian sect, of the second century, who were so called from their leader Bardesanes, a Syrian of Edessa. Strunzius has given a history of this sect. Like the Necessarians and Calvinists of the present day, they were a kind of fatalists who believed in stern necessity. They had been taught that God himself was subject to necessity, and that the actions of men depended altogether on fate. They also denied the incarnation of Christ and the resurrection of the body.

BARO SOUND, in the Gulf of Finland, about twelve miles from Sweaborg, and fifteen from Revel. Here the French and English fleets, amounting to 51 ships of war, anchored in June 1854.

BAROSEL'ENITE (Gr. *βαρὺς* heavy, and *selenite*), a mineral, the sulphate of Barytes, or heavy spar, consisting of barytes, 66, and sulphuric acid, 34. It is found in veins, in various rocks, both stratified and igneous. One of these veins in Renfrewshire, Scotland, is sixteen feet in width. This mineral is of a foliated structure, and often of a white or flesh-colour. Its specific gravity is 4·7.

BARRACK HOSPITAL. During the late war with Russia, the English government obtained the use of two large hospitals at Scutari, in addition to branch establishments at Balaclava, Abydos, &c. These were called the General Hospital, and the Barrack Hospital. The former was close to the Turkish cemetery; it covered a large area of ground, and consisted of several floors. The Barrack Hospital was about half a mile distant from the first-mentioned establishment. It was an immense building, very similar in construction to the General Hospital, enclosing a large open court or parade ground. A space nearly two miles and a half in length was occupied by beds, at an average interval of about two feet six inches. The corridors were of great length. Here the wounded at the Alma, Balaclava, and Inkermann, and the brave fellows who sank under the effects of want and cold, died by hundreds during the winter of 1854–1855. Many a gallant warrior perished from neglect; yet in all their misery and suffering not a murmur escaped their lips. Never was the fortitude of the British soldier more severely tried; and the heroism with which the bitter ordeal was borne stands unparalleled in the annals of war and disaster. (Osborne's *Scutari and its Hospitals.*)

BARRICADES. During the great religious wars in France, when Paris was alternately in the power of the Faction of the Sixteen, and the Guise family, the princes of Lorraine, these street fortifications were first used by the populace. Summoned by the leaguers to the capital, the duke of Guise, in an insolent manner, called upon that vacillating and feeble monarch, Henry III. of France, to proclaim a war of extermination against the Huguenots. To this the king consented, on condition that the duke of Guise should assist him in expelling all strangers and idlers from Paris. Guise promised to render aid; the king summoned the nobility, and ordered 4000 Swiss to march to Paris. Their entrance with flying colours aroused the populace, and a general revolt ensued. The streets were quickly unpaved, and chains placed across them. Stones were hurled from the windows, and the royal troops found themselves completely hemmed in. At the request of the king, the duke of Guise mediated between him and the people, and the barricades were removed. This occurred in 1588, and was called the Battle of the Barricades. The example has since been very frequently and successfully imitated.

BARRING-OUT (ii. 917). This singular custom, which so generally prevailed at our public schools during the 17th and 18th centuries, as

described by Hutchinson, Brand, and others, is now rapidly falling into desuetude. One of the last efforts to maintain the assumed privilege of barring-out the master, previous to the Christmas holidays, was made at the Ormskirk Grammar School, early in the present century; and the account of it, first given in the 'Gentleman's Magazine,' and copied in Bohn's edition of Brand's 'Popular Antiquities,' is interesting, from its being, perhaps, the last similar attempt on record, and also from the writer of the article, who is still living, having himself been one of the juvenile leaders.

'The Christmas holidays were approaching,' says the writer, [we copy from the sixth volume of the 'Family Tutor,' where his name appears], 'and every juvenile heart beat high with pleasurable associations. It was a few days before the happy period arrived, when the leading scholar of the head form entertained the thought of reviving the ancient but almost obsolete custom of "barring-out" the master of the school. Many years had elapsed since the attempt had succeeded, and many times since that period had it been made in vain. The scholars had heard of the glorious feats of their forefathers in their boyish years, when they set the lash of the master at defiance for days together. Now, alas! all was changed; and the master, in the opinion of the boys, reigned a despot absolute and uncontrolled. The merciless cruelty of his rod and the heaviness of his tasks were insupportable. The accustomed holidays had been rescinded; the usual Christmas feast reduced to a nonenity, and the chartered rights of the scholars were continually violated. These grievances were discussed one by one; and we were all unanimously of opinion that our wrongs should, if possible, be redressed. At the head of the Greek class there was one whose very soul seemed formed for the most daring attempts. He communicated his intentions to a chosen few, of whom the writer was one, and offered to be the leader of the undertaking, if we would promise him our support. We hesitated, but he represented the certainty of success with such feeling eloquence that he entirely subdued our opposition. He stated that Addison had acquired immortal fame by a similar enterprise. He told us that almost every effort in the sacred cause of freedom had succeeded. He appealed to our classical recollections; Epaminondas and Leonidas were worthy of our example; Tarquin and Cæsar, as tyrants, had fallen before the united efforts of freedom: we had only to be unanimous, and the rod of this scholastic despot would be for ever broken. We then entered enthusiastically into his views. He observed that delays were dangerous; the "barring-out," he said, "should take place the very next morning, to prevent the possibility of being betrayed." The boys were accordingly told to assemble after school-hours at a well-known *tombstone*, in the neighbouring churchyard, as something of importance was under consideration. Our leader took his stand at one end of the stone, with the head boys who were in the secret on each side of him. "My boys," he laconically observed, "to-morrow morning we are to *bar out* the flogging parson, and to make him promise that he will not flog us hereafter without a cause, or set us long tasks, or deprive us of our holidays. The boys of the Greek form will be your captains, and I am to be your captain-general. Those who are cowards had better retire, and be satisfied with future floggings; but you who have courage, and know what it is to be flogged for nothing, come here and sign your names." The captain-general then addressed us:—"I have the key of the school, and shall be there at seven o'clock. The old parson will arrive at nine, and every one of you must be there before eight, to allow us one hour for barricading the doors and windows. Bring with you as much provisions as you can, and tell your parents that you have to take your dinners in school. Let every one of you have some weapon of defence; you who cannot obtain a sword, pistol, or poker, must bring a stick or cudgel. Now, all go home directly, and be sure to arrive early in the morning."'

The writer then enters into graphic details of the feelings, operations, and final defeat of the juvenile rebels.

BARRINGTONIA, a lofty-growing and beautiful Indian tree, of the natural order Myrtaceæ, so called in compliment to the honourable Daines Barrington (ii. 917). It has rich shady branches of long wedge-shaped conaceous leaves, and large handsome flowers, which open at sunrise, with beautiful effect, and close at sunset.

BARROSSA, HEIGHTS OF, in the south of Spain, celebrated for a severe and sanguinary contest between the British troops under General Graham (afterwards Lord Lynedoch), and the French army under Marshal Victor, during the Peninsular war in 1811. The attempt of the Anglo-Spanish army, under General La Pena, was the immediate cause of the battle. Victor held the key of the position; but the brave Graham was determined on dislodging him. The combat was close and furious; but the impetuous valour of the British was not to be resisted; and they defeated and forced the enemy over the heights with great slaughter. Our loss amounted to 50 officers, 60 sergeants, and 1100 rank and file; while the French lost 3000 in killed and wounded, and two generals.

BARROW, SIR JOHN, Bart., F.R.S., a voluminous writer, and many years secretary to the Admiralty. He was born at the village of Dregleybeck, near Ulverstone in Lancashire, and was educated at the Town Bank grammar school. He owed his attainments, and subsequent elevation in life, to his own indefatigable application. At the early age of fourteen he was engaged in taking a survey of Col. Braddyl's estates in Yorkshire, and acquired so much knowledge of the theodolite and the various mathematical instruments then in use, that, on arriving in London some years afterwards, he drew up and published a small treatise on their practical use. He afterwards obtained a situation at Liverpool as superintendent and clerk of an iron foundry, which he quitted for the sake of undertaking a voyage to Greenland in a whaler, where he gained some experience in the practical duties of a seaman. His

next employment was as mathematical teacher at Dr. James's academy at Greenwich. Through the interest of Sir George Staunton he was appointed 'Comptroller of the Household' to Lord Macartney, and proceeded with his patron in that capacity to China. Lord Macartney's next public service was to settle the government of our newly-acquired colony of the Cape of Good Hope; and Mr. Barrow, in 1797, had to accompany his lordship as private secretary. So highly were his services appreciated by his lordship, that on leaving the colony, in 1789, he left Mr. Barrow in the situation of auditor-general of public accounts. On the evacuation of the Cape in 1803, Mr. Barrow returned to England, and published the results of his observations, under the title of 'Travels in South Africa.' In 1804 he was appointed by Lord Melville second secretary to the Admiralty; and, with the exception of a short interval, he continued to hold this office till 1845. In 1835 he had been created a baronet, and in 1845 he retired from public life, on account of his advancing years.

As an author Sir John was exceedingly industrious, and very successful. Besides contributing numerous articles, on a variety of topics, to the Encyclopædia Britannica, and the Quarterly Review, he published a 'Review of the Life of Admiral Lord St. Vincent,' and the lives of Lord Macartney, Lord Anson, Lord Howe, and Peter the Great; Travels in China, Voyage to Cochin-China, the Mutiny of the Bounty, his own Autobiography, Chronological History of Arctic Voyages; and Voyages of Discovery and Research within the Arctic Regions. In addition, Sir John was the constant and successful advocate at the Admiralty of those voyages of discovery in the Arctic regions, which have enlarged the bounds of science, and conferred eternal honour on the British name. He died in 1848.

BARROW ISLAND (ii. 921). This island was so called after John Barrow, whose father is so well known by his writings on Arctic discoveries. It is situated in the Arctic regions, and was discovered by Captain Penny in 1851.

BARTHOLDY, Dr. FELIX MENDELSSOHN, the celebrated musical composer. He was the grandson of Moses Mendelssohn, the Jewish philosopher, who was commonly called the 'Socrates of the Jews.' He was born at Berlin in 1809, and at an early age exhibited a great precocity of talent for music. He was only nine years of age, when, to the surprise of a large audience, he performed at a public concert in Berlin; and when only twelve years old he composed his pianoforte quartette in C minor, which, as being full of interest and originality, is still appreciated and admired by the musical world. In 1824 some of his first compositions were published, which were soon followed by his opera of 'The Marriage of Gamachio,' his first symphony, and his 'Midsummer Night's Dream.' This last piece produced an electric effect on the public mind. He now devoted himself almost exclusively to musical pursuits. In 1833 he was appointed to the directorship of the concerts and theatre of Dusseldorf; and in 1835 he produced the great oratorio of 'Paulus,' which was brought out at this theatre. In 1845 he was appointed to the directorship of the royal theatre at Leipsic, where young men were in the habit of flocking from all parts of Europe, for the purpose of submitting their musical productions to his judgment, as well as becoming acquainted with so illustrious an artist. At the earnest request of the King of Prussia, he soon afterwards accepted the musical directorship at Berlin; but in a short time he relinquished it, and returned to his favourite place, Leipsic. Here he acted as conductor of the concerts, and director of the Conservatory of Music, until the time of his death, which took place in 1847.

BARTON, BERNARD, the 'Quaker poet' and philanthropist. He was born near London in 1784; and in 1804 he became a clerk in Alexander's bank at Woodbridge, in which position he remained almost to the period of his death. In 1811 he first made his appearance as a poet; and the volume of Miscellaneous Poems which he then published was followed by numerous others, chiefly devoted to homely subjects, but all of them inspired by the purest sentiments, and glowing with the liveliest fancy. But it was not so much for his poetical talents that he deserves commendation, as for those social qualities which endear a man to all who come within their influence; especially when to those qualities were superadded a benignity of mind and liberality of feeling. His death took place in 1849.

BARYSTRON'TIANITE (Gr. *βαρὺς* heavy, and *Strontian* a mineral), is a soft and brittle mineral, which effervesces with acids; of a greyish-white colour externally, but approaching to yellowish-white internally. It occurs at Stromness in Orkney, whence it was sometimes called Stromnite. Its constituent elements are, carbonate of Strontia, 68·6; sulphate of baryta, 27·5; carbonate of lime, 2·6; oxide of iron, 0·1; loss, 1·2.

BARYXY'LUM (Gr. *βαρὺς* heavy, and *ξύλον* wood), a genus of trees, indigenous to Cochin-China. The wood is iron-coloured, and extremely heavy, whence its generic name.

BASAL'TINE, a mineral with a foliated texture, known as basaltic hornblende. Its component parts are, silica, 58; alumina, 27; iron, 9; lime, 4; and magnesia, 1. It is of a dark green or yellowish colour, and occurs in rhomboidal prisms.

BAS'ANITE (Gr. *βάσανος* a touch-stone), a variety of basalt, which contains disseminated crystals of olivine or other minerals. It was the name formerly given to a variety of silicious slate, from its being used as a test in determining the purity of gold by the colour of the streak.

BASE, or BASIS, is a very common and convenient term in chemistry, denoting those species of salts which differ with regard to the acid, but agree as to the alkali, earth, or metallic oxyd which they contain. These bases constitute the primary elements of matter, and therefore some general knowledge of their classification and properties is of importance.

The substances in nature considered as elemen-

tary, so far as our scientific discoveries extend, amount to about sixty. They all possess several properties in common, although, in subordinate particulars, they differ from each other; but the whole are concealed, as it were, in compounds, of which they constitute the bases. Some of these elementary substances, or bases, exist so extensively in the material world as to constitute a large portion of the external surface of the globe, while others are so scarce as not to be discovered without extreme difficulty. Some of them enter into combination with great facility, and often with remarkable homogeneity. While many of them, however, are found readily to combine, in various proportions, with nearly all the rest, others can scarcely be made to combine under any circumstances. It is the powerful law of affinity and repulsion which is for ever operating on matter, and constitutes one of the most important elements in chemical science.

The classification of these bases, or primary elements of matter, is in some degree arbitrary. They have been differently arranged by different writers. Dr. Thomson, however, has succeeded in reducing them to something like system under the general heads of *Acidifiable* and *Alkalifiable* bases.

The ACIDIFIABLE BASES have been so called from their property of generally forming acids when combined with the supporters of combustion. An acidifiable base may be defined as any simple substance or compound that can unite without decomposition with oxygen, so as to possess acid properties. Though most acids contain oxygen, yet they differ in their radicals; so that the acidifiable base determines the kind of acid (*see* ACIDS). The acidifiable bases comprehend seventeen primary elements, which consist of hydrogen, carbon, azote, boron, silicon, phosphorus, sulphur, selenium, arsenic, antimony, tellurium, chromium, uranium, vanadium, molybdenum, tungsten, titanium, and columbium; each of which is explained in its proper place.

The ALKALIFIABLE BASES have been so denominated because the compounds formed from all of them partake, more or less, of an alkaline character. These bases comprehend thirty-one different substances, which have been classed under five families, whose distinctive characters are sufficiently indicated by their names. They consist of *Alkaline* bases, *Earthy* bases, *Difficultly Fusible* bases, *Easily Fusible* bases, and the *Noble Metals*.

Alkaline Bases are those which possess the acrid qualities of the alkalies, and have also the property of solubility in water to a certain extent, and also of changing blue and red vegetable colours to green, and of absorbing carbonic acid. They consist of seven primary elements,—potassium, sodium, lithium, calcium, magnesium, strontium, and barium, which are all fully explained in their proper places. It may, however, be here observed that potassium and sodium are the metalloid bases of those useful and very common alkaline substances, potash and soda, which are compounds of these metals with oxygen, and through all their various combinations form most important principles in nature. Their existence, indeed, can be traced to the earliest formations of the globe, and even appears necessary to the existing order of things. The basis of potash at 60° Fahrenheit is only imperfectly fluid; at 70° it becomes more fluid, and at 100° its fluidity is perfect; so that different globules may be easily made to run into one. At 50° it becomes a soft and malleable solid, which has the lustre of polished silver; and at the freezing point of water it becomes harder and brittle, and when broken in fragments it exhibits a crystalline texture. Sir H. Davy, in his experiments on soda, has discovered that its base, like that of potash, is white and opaque, and has the lustre of silver. This great chemist made several curious and ingenious experiments to ascertain the proportions of the bases and oxygen in these two fixed alkalies, from which he concluded that 100 parts of potash consisted of about 84 bases and 16 oxygen; and that 100 parts of soda consisted of about 76 or 77 bases and 24 or 23 oxygen; in short, that potash may be considered as consisting of about 6 parts bases and 1 of oxygen, and soda of 7 bases and 2 oxygen.

The other alkaline bases are of much less importance. Lithium, which is only met with in small quantities, is the metallic base of the well-known substance *lithia;* Calcium is the base of lime; Magnesium the base of *magnesia;* Strontium the base of *strontia;* and Barium the base of *barytes*.

Of the *Earthy* bases there are eight distinct substances, viz.:—Aluminum, glucinum, yttrium, zirconium, thorium, cerium, lantanum, and didymium. Aluminum is the metallic basis of the earth *alumina*, which is the characteristic ingredient of the well-known salt called *alum*, one of the most abundant productions of nature.

The *difficultly fusible* bases are iron, manganese, nickel, and cobalt. Iron is one of the most abundant elementary substances in nature. It exists in minute quantities in almost all vegetable and animal products, particularly in the blood. Manganese bears some resemblance to iron in a few of its properties; but, though much diffused, it is not an abundant metal. Nickel and cobalt are metals somewhat resembling each other in their properties, though they are not very abundant. They are both found combined with iron in those mineral bodies known by the name of aërolites.

The *easily fusible* bases consist of zinc, cadmium, lead, tin, bismuth, copper, and mercury. Zinc and cadmium are usually found together in nature, and are much alike in their properties; but cadmium is less abundant than zinc, and is only of recent discovery. The other five metals are well known.

Of the *noble metals*, silver and gold are both met with in the metallic state; but silver also occurs mineralized. Platinum, palladium, rhodium, iridium, and osmium are metals generally associated in small quantities, chiefly in certain districts in South America, and recently in the old world. Of these metals, platinum is the most

abundant, and at the same time it is the heaviest body in the mineral world.

(Dr. Thomson's *Chemistry;* Sir H. Davy; Prout's *Bridgewater Treatise,* &c.)

BASE, or BASIS, has several applications in science and art. In geometry it is the lowest side of the perimeter of a figure; thus the base of a triangle is properly the one parallel to the horizon. The base of a solid figure is that on which it stands. Base of a conic section is a right line in the hyperbola and parabola arising from the common intersection of the secant plane and the base of the cone.

Base in fortification is the exterior line of the polygon, or the imaginary line drawn from the flanked angle of a bastion to the opposite angle.

Base of operations, in military tactics, is that line of frontier, or fortresses, or strong country in the possession of troops, or of sea occupied by fleets, from which military operations advance, and munitions are supplied, and on which a retreat may be made when required.

Base in gunnery is the least kind of ordnance, the diameter of the bore not being more than 1¼ inch.

Base in architecture is the lower part of a pedestal and column. The base of a column is that part between the shaft and the pedestal, if there be one; otherwise between the shaft and the plinth.

Base line, in perspective, is the common section of a position, and the geometrical plane.

Base is also a law term, applicable to different tenures; as *base fee* is that which is held in fee at the will of the lord. *Base* tenure is the holding of lands by villenage or other customary services. *Base estate* is such as base tenants possess, &c.

Basis cordis, in anatomy, is the superior part of the heart to distinguish it from its apex or small point, and *basis cerebri* is the posterior and lower part of the brain.

BASEL'LA (Malabar, *the climbing nightshade*), a genus of plants of the class Pentandria, and order Trigynia; and, according to the natural order, it ranks under Chenopodiaceæ. It has no calyx; its corolla is seven-cleft, and its seed one. There are a variety of species, some of which furnish a summer spinach in China and Paris. The principal of these species are the *alba* and the *rubra.* The first climbs to a considerable height, and sends forth numerous branches. It has oval leaves, and small flowers and fruit. The *rubra* has red leaves and simple foot-stalks, with thick, strong, succulent stalks, and leaves of a deep purple colour.

BASHI-BAZOOKS. In 'Pictures from the Battle-Fields,' the Roving Englishman gives the following account of these extraordinary soldiers:—

'The fellow is a barbarian, and looks like it. He is tawdry, loose, and dirty beyond belief. He is fierce, selfish, and greedy, to an equal degree. He is clumsy and awkward. His gorgeous clothes seem to be thrown on, rather than put on, and his apparel presents the same odd contrast as his mind. He comes from some far-away country—from the mountains of Caramania or Albania, from Syria, or where not, so that he does not comply with the modern fashion of the Turks at Constantinople, and cover his head merely with a red cap; but he twines an immense shawl in picturesque folds round and round it, till he looks, when sitting down, like a gigantic mushroom. * * * * * An immense sash of thick silk is wound many times round his loins, and again above it is girded a broad thick red leather belt, with pockets and receptacles for arms. This makes a capital support for a man who sometimes passes twenty hours on horseback at a time, and who never saw a chair with a back to it. His pistols and silver-sheathed sword (as splendid and untrustworthy as the pistols), stick out so far both before and behind, that he could hardly wear a long coat, or button even a short one. His waistcoat, therefore, is one dirty blaze of bad embroidery in front, and he has also embroidered sleeves to it; while his jacket is made something on the principle of an hussar's, save that it covers both shoulders; that is to say, the large open fantastic sleeves hang down behind, like a fanciful pair of golden wings. His breeches are also embroidered, and they appear, at first sight, too short, for they fasten far above the knee, and leave the hinges of the leg as free as a Highlander's, and probably for the same reason. A man had better not confine or cramp his knees who is always scrambling up and down mountains, and who must be always ready for a dashing leap across some yawning chasm. From the commencement of the calf of the leg down to the ankle, the limb is bandaged as tightly as strength can bandage it. It is bandaged till the leg becomes as hard, as shapeless, and almost as thin as a broomstick. Over the bandages he wears leggings of the same eternal gold tinsel, confined by long, gay, flaunting garters of scarlet silk. His shoes are curiously old and foul; he kicks them off, therefore, at every opportunity, and curls his legs under him. He is a curious study, but he does not improve on acquaintance. He has none of the virtues or vices of a soldier. He avoids fighting whenever it is possible, and will think it an extremely proper thing to decamp on the approach of danger. His idea of the duties of the military profession is firing felon shots with a long rusty gun, from a rock on the sea-coast, or a tree by the wayside. His glory is to surprise and butcher the defenceless as they wind through some lonely mountain gorge; to torture his prisoners for sport; to rob his friends adroitly. He is a mere marauder, a bandit, a ruffian. His savage heart would make a monster of him, if it were not so often palsied by a dastard fear. His love of money is a passion; he clutches it with a rapacity, and hoards it with a secrecy, quite wonderful. He would not give a piastre to save his comrade from being flayed alive; he would rather even suffer torture than part with it for any purpose, save that on which his foolish heart is set. Perhaps he covets some glittering ring which he has seen in the bazaar, and cannot steal; perhaps he wants a watch, or a more magnificent pair of pistols, or a new pair of silver-hilted pincers, to take little bits of ardent charcoal out of

the fire and light his pipe. He plucks out his beard to look young. He waxes his moustachios, and arches his eyebrows with his dagger; yet this love of fine appearance seems strange in a man who always leads a solitary roving life, who will never marry, and who lives unloved; who would as *soon* rend the coins from a virgin's hair, as ease a Rayah merchant of his ducats. He is abstemious, almost to contempt of dainty food; a few grapes or olives, according to the season, a lump of coarse black bread, a few onions, and a little unsweetened coffee, is all he cares for. He has a great fear of disease and death. He wears charms and talismans to protect him from harm. He believes in omens and magicians; but he has no real religion.'

In justice to the much-maligned Bashi-Bazooks we append Mr. Duncan's description of those whom he met in the army of Asia ('A Campaign with the Turks in Asia,' vol. i. chap. xv.) That gentleman says: 'The Bashi-Bazooks themselves were composed of the most heterogeneous elements. There were Arabs of the desert, proud and valiant, also savages from Kurdistan, both cowardly and knavish. Then there were adventurers from towns of Syria, and the pachalicks of the East. Men of all trades and classes composed the latter division; lazy peasants, broken-down horse-dealers, and adventurous youths, formed the majority; and all these had taken service with their respective leaders, in the hope of obtaining Russian plunder and Georgian slaves, but with the firm determination of not fighting. Of all the Bashi-Bazooks the Arabs were alone trustworthy; the remainder were worthless, and a considerable nuisance to the army. * * * * * The Bashi-Bazooks were all well mounted on dashing little steeds, but were imperfectly armed. If armed, each with a lance and sabre, and headed by a few spirited officers, they would prove a most useful and formidable body. They are inured to fatigue, and from their very infancy are trained to martial sports and martial inspirations. As a light irregular cavalry they are certainly unequalled, and very far surpass the Cossacks in courage and in powers of endurance. What these poor fellows subsisted on, and how they contrived to keep their horses alive, remains a mystery.'

BASILID'IANS, a celebrated sect of Christians, who sprang up in the second century. Their founder Basilides, from whom the sect took its name, was an Egyptian, and educated in the school of the Gnostics, over which Simon Magus presided. It is related that he forged the names of several prophets, to two of which he gave the names of Barcaba and Barcoph. The members of the sect over which he presided believed that Christ was a man only *in appearance*, that his body was a phantom, and that he gave his form to Simon the Cyrenian, who was crucified in his stead.

BASTER'NA, the name of a chariot first used by the Romans, from whom it passed to Gaul and other countries. It was sometimes employed in war for carrying baggage, &c.; but at Rome it was used as a covered vehicle for the Roman ladies, when it was furnished with cushions, and often carried like the lectica or litter. According to Salmasius, Causaubon, and others, it was sometimes drawn by oxen or mules. Our modern chariots are evidently Basternas improved; for they have little resemblance to the ancient *currus*, from which they have been named. The Romans divided the litter into the basterna and lectica, both being bodies of carriages fixed upon poles. The basterna, gilt and glazed, and used by married women, was carried by mules; the lectica, generally open, by slaves. The invention of the basterna was derived from the king of Bithynia, and the fashion ceased under Alexander Severus; chariots or carriages gilt, or plated, according to the imperial permission, being substituted.

BATH OOLITE, a kind of stone much used in building. It is one of the members of the oolitic formation of England, and is oolitic in its structure. It contains a considerable quantity of broken shells.

BATHS AND WASH-HOUSES (ii. 987). Since the article on this subject was penned, a great improvement has taken place in the metropolis, as well as in other towns of the United Kingdom, with respect to the supply of water, and the accommodation afforded to all classes for the purposes of bathing. Mr. Cape ('Baths and Wash-Houses,' p. 33) gives the following as the origin of the modern Baths and Wash-houses. 'In 1832, when the cholera was raging, a poor woman, who lived in one of the back streets of Liverpool, called Frederick-street, knowing from experience the misery and unhealthiness that is always consequent upon dirt, and the discomfort arising from washing in confined rooms, and possessing, moreover, a copper in her own kitchen, hit upon a plan of serving her neighbours and herself at the same time. She offered to those who wished, the opportunity of washing at her copper. This boon, small as it may appear, was eagerly sought. In a short time her yard, her kitchen, and her passage, were crowded by those who had not this accommodation at home. Several charitable ladies, and a District Provident Society, aided her endeavours, and for a length of time eighty-five families, weekly, used this humble Wash-House, her charge for the same being only one penny per week.' From this simple circumstance the idea was taken, and in May 1842 a small establishment was opened in Frederick-street, Liverpool. In London a similar scheme was in progress, and in 1846 an Act (9 & 10 Vict. cap. 74) was passed, to encourage the establishment of Public Baths and Wash-Houses. Although temporary places had been opened in the metropolis, the larger establishments date since the passing of that Act.

BATOUM, or BATUM, a seaport in Georgia, on the shores of the Black Sea, about one hundred miles N.E. of Trebizond.

BATRA'CHIANS, in zoology, the fourth order of reptiles, comprising frogs, toads, &c., which have naked skins and external branchiæ or gills in the early state. Most of them lose the branchiæ when they attain maturity,—three genera only, the Syrens, the Protei, and Menobranchi, retaining them at all ages. Cuvier describes them

as having but one auricle and one ventricle to the heart; but this has been disproved by Professor Owen. Their lungs are always equal, and to these when young they conjoin gills, which gives them a relationship with the class of fishes. But in the species which shed their gills, the vascular ramifications that communicate with them become obliterated, except two, which unite together to form a dorsal artery, each giving off a small branch to the lung of its particular side; so that the circulation of a fish becomes thus converted into that of a reptile. Their eggs or spawn enlarge very much in the water after they have been laid. The envelope of their eggs is simply membranous, and in most cases they are fecundated as they issue forth, the male attaching himself to the other sex in order to be simultaneous. The young not only differs from the adult by the presence of its gills, but its feet are only developed by degrees; and in several genera there is also a deciduous beak and tail, and intestines of a different form. Some of the species are even viviparous.—(Cuvier's *Règne Animal.*)

BATTA, a term used in India to denote a percentage or allowance; thus the sicca rupee is said to bear a batta of 6 per cent. against the current rupee, as 100 sicca rupees are equal to 116 current rupees. It is also an allowance made to the officers in the East India Company's service, in addition to their pay, in order to preserve an equality between them and the officers in the service of the Crown.

BATTLE, WAGER OF (i. 932). Trial by combat was early practised on the Continent, whence our mediæval ancestors probably derived it. The following is an instance on record among the Helvetians. Two men of Glaris, near relations, were walking together along the edge of a precipice. One of them, who was heir to the other, pushed him over. The fall, however, did not prove fatal; and an accusation was brought against the aggressor, who invented a counter-accusation in his defence. The parties were closely examined by the judges, and both parties put to the rack, but each persisting in his own statement, the truth remained undiscovered. At length it was determined by the general assembly of the people that the case should be tried by judicial combat. The two champions met in the public square before the church of Glaris on the 12th of August, 1423. On entering the lists, with drawn swords in their hands, they stripped to their shirts and drawers. The Landamman Ischudi and sixty judges sat round, with the inhabitants behind them, all except the relatives of the parties. At a signal the combatants engaged. They fought long, and for a time with very equal success. At length the innocent man was victorious; and his adversary, as he lay weltering in his blood, acknowledged the justice of his fate, and that he was guilty of the charge brought against him.

BATTUE, a French word that has recently been introduced into our language by sportsmen. It derives its origin from a foreign practice of having the game driven into one spot, from which escape becomes almost impossible. This un-English method of slaughtering game has of late been adopted amongst us. Prince Albert is generally supposed to be the first person who tried the plan in this country.

BAVARIA, KINGDOM OF (iii. 1-10). The kingdom of Bavaria is now divided into eight circles; the extent of which in square miles, and the population in 1852, were given as follow:—

Circles.	Area.	Pop.	Chief Cities.
Upper Bavaria	6,614	734,831	München
Lower Bavaria	4,113	549,596	Landshut
Palatinate	2,226	611,476	Speyer
Oberfalz and Regensburg	4,198	468,479	Regensburg
Upper Franconia	2,226	499,709	Baireuth
Middle Franconia	2,798	533,830	Ansbach
Unterfranken and Aschaffenburg	3,604	595,748	Würsburg
Swabia	3,858	565,738	Augsburg
Total	29,637	4,559,407	

The commerce of Bavaria is almost exclusively confined to agricultural produce. The exports are estimated at about a million and a half annually, and consist of grain, timber, wine, cattle, salt, hides, wool, hops, fruits, butter, cheese, and glass. The chief imports are cotton, sugar, coffee, and other foreign-grown products and manufactures. The public revenue in 1851 was 34,785,685 fl.; national expenditure 37,325,516 fl.; and the national debt 136,995,620 fl. The proportions of the different religious sects are—Roman Catholics, 3,060,694; Protestants, 1,181,216; Reformers, 2717.; other Christians, 4836; Jews, 59,288. The permanent army in time of peace amounted, in 1851, to 1540 men, besides four companies of veterans, of whom about one-third are usually under arms. As one of the states of the Germanic Confederation, it holds the third rank, and has four votes in full council. Its military contingent is 35,000 men, which forms the fourth corps of the federal army.

BAYAZID (iii. 16), BATTLE OF. In 1854, during the recent war, the right wing of the Turkish Anatolian army, consisting of 5000 troops with seven pieces of cannon, was posted at Bayazid, being held in check by the Russian left wing, which rested upon Erivan. Selim Pacha commanded the Turkish army, and was strictly ordered,—1. By no means to engage the enemy. 2. In case of being seriously menaced by the Russians, to abandon Bayazid, and retire upon Kars. 3. In case of a defeat to fall back upon Erzeroum, and by no means to take refuge in Vau, an ancient fortified town, as, by so doing, he would leave the road to Erzeroum open to the enemy. The Ottoman general, however, thought fit to disobey all these instructions. On the 28th of July, 1854, a Russian *corps d'armée*, 8000 strong, with thirteen pieces of cannon, advanced from Erivan, in the direction of Bayazid. Selim

Pacha, instead of retiring on Kars, sallied out with his small force to engage the enemy. The two armies met on the 29th of July, when the Turks were defeated with a loss of 1800 in killed, wounded, and prisoners. Selim Pacha took refuge outside of the town of Vau, as the governor closed the gates of the city against his fugitive force. This defeat cut off the commercial relations between Turkey and Persia, and led to the great battle of Kurekdere, in which the main body of the Turkish army in Asia suffered another terrible defeat. (Duncan's *Campaign with the Turks in Asia;* Dr. Russell's *History of Modern Europe.*)

BAYLEY, SIR JOHN, a learned and upright judge, who was one of the justices of the court of King's Bench, and the author of a valuable standard work in the profession, entitled 'The Law of Bills of Exchange.' He was born in 1772; and in 1792, after passing through the routine of a legal education, he was called to the bar. In 1799 he was appointed a serjeant-at-law; and in 1808 was made one of the justices of the King's Bench, when he received the honour of knighthood. He was a man of liberal education and enlarged mind; and the value of his work on bills of exchange is universally acknowledged by the commercial world, as well as by the legal profession. He died in 1841.

BEDFORDSHIRE (iii. 81–85). According to the census of 1851, the entire population of this county was 124,478, of which 59,941 were males, and 64,537 females. Of houses, inhabited and uninhabited, there were 25,334. The population of the principal towns was as follows:—

Ampthill ..	1,961	Leighton-Buzz.	4,465
Bedford ..	11,693	Luton	10,648
Biggleswade ..	3,976	Potton	1,922
Dunstable ..	3,589	Shefford	1,052
Eaton-Socon ..	2,802	Toddington ..	2,438
Harrold ..	1,083	Woburn ..	2,049

BEEL'ZEBUB, a god of the Philistines, who had a celebrated temple at Ekron. In Scripture he is called 'the prince of demons or gods;' and in modern times his name is synonymous with Satan himself. Scaliger derives the name from Baalim Zebahim, which signifies the 'Lord of Sacrifices;' but the literal meaning of the name, as an oriental word, is 'the god of flies,' which, from the annoyance they caused in the East, he was probably invoked to destroy; as Apollo was sometimes worshipped by the name of Smintheos, 'the destroyer of rats.'

BEGUARDS, or BEGHARDS, a religious society not under a monastic vow, established first at Antwerp in 1228, when they selected St. Begghe as their patroness. The name is a compound of *beg* (from the old Saxon *beggen*, mendicare), and *hard*, or *hart*, a servant. This word is still used in composition, as in shepherd, cowherd, swineherd. They made a profession of poverty, and supported themselves by labour, or soliciting alms, without living under any particular rule. In 1290 they were induced to embrace the third order of St. Francis. In 1425 they began to live in common, and in 1467 took religious vows.

BEICOS BAY. This bay is in the Bosphorus, between the sea of Marmora and the Euxine, and was the rendezvous of the French and English squadrons, after their commanders had received orders to quit Besika Bay, outside of the Dardanelles, in October 1853. They remained in this anchorage until January 1854, when, owing to the outrage of Sinope, they were ordered into the Black Sea.

BELBEK, a river in the Crimea that rises in the hills to the north of Sebastopol, and falls into the Black Sea, a short distance to the westward of that celebrated stronghold. On its banks the rival armies were concentrated in great force in 1855 and 1856.

BELFRA'GIUM, in mediæval warfare, a movable tower, with several stories, adapted for attacking the walls of fortified towns, something like the movable towers of the Romans. Some of these belfragia were of immense magnitude, and had from ten to twenty stages or floors, which presented a pyramidal form. The principal belfries were like wooden castles, regularly fortified. Before wheeling up the machine, a *cat*, made of osier twigs and leather, and covered with planks, was used, for the purpose of protecting those whose business it was to fill up the ditches that surrounded the walls. In Grose's 'Military Antiquities' is the representation of a belfragium consisting of a ground-floor, occupied by a battering-ram, and four upper stories, which are filled with cross-bowmen and archers. The uppermost story appears above the town; and a draw-bridge, from the story underneath, rests on the walls, for the purpose of scaling the place, while the archers above are protecting the assailants.

BELGIUM (iii. 115–21). The area in square miles, and the population of the different provinces, are thus stated in the government official report of 1849:—

Provinces.	Area.	Pop.	Ch. Cities.
Antwerp (Anvers)	1,094	413,824	Antwerp
W. Flanders . .	1,243	711,332	Bruges
E. Flanders . . .	1,154	626,847	Ghent
Hainault	1,430	781,143	Mons
Liege	1,111	723,539	Liege
Brabant (S.) . .	1,260	460,663	Brussels
Limbourg . . .	929	185,621	Hasselt
Luxembourg . .	1,695	187,978	Arlon
Namur	1,397	268,143	Namur
Total	11,313	4,359,090	

Belgium is now the only country in the world which possesses a complete system of railways; and the increase in her trading prosperity is in a correspondent ratio. In 1851 her imports amounted in value to 241,059,000 fr.; and her exports, in the same year, were valued at 258,828,000 fr., consisting of hempen and linen cloths, glass wares, refined sugar, cattle skins, corn, iron and nails, oil, seeds, flax, and machinery. Antwerp, Ostend, and Nieuport are the chief ports. The population is almost entirely

Roman Catholic; but the clergy of all sects are supported by the state.

BELL (iii. 125), BIG BEN OF WESTMINSTER. This monster bell for the clock tower of the new palace at Westminster was cast at the village of Norton, near Stockton-on-Tees, on the 6th of August, 1856. It was conveyed to West Hartlepool by railroad, and thence to London by ship. Its diameter is 9 feet 5½ inches; the height outside 7 feet 10½ inches; inside 6 feet 8 inches. The weight is stated to be 15 tons, 18 cwt., 1 quarter, 22 lbs, or 16 tons within a fraction; which is nearly half as much again as the great bell of York Minster, more than twice that of Oxford, nearly three times as heavy as the large bells of Exeter, Lincoln, and St. Paul's, and exactly six times the weight of the 'great bell of Bow.' The thickness is 9⅜ inches at the sound-bow, where the hammer strikes, and 3⅛ in the upper part, being very nearly $\frac{1}{12}$ and $\frac{1}{38}$ respectively of the diameter at the mouth, 9 feet 5½ inches. The composition is 7 of tin to 22 of copper melted twice over, as in speculum metal, to secure a perfect alloy. The note is E natural. The bell has the following inscription running round it, just above the sound bow:—'Cast in the 20th year of the reign of Her Majesty Queen Victoria, and in the year of our Lord 1856, from the design of Edmund Beckett Denison, Q.C.; Sir Benjamin Hall, Bart., M.P., Chief Commissioner of Works.' On the waist or middle of the bell are the royal arms. It was cast by John Warner and Sons, and is called 'Big Ben,' after the Chief Commissioner of Works.

BELL-TELEGRAPH, a sort of registering apparatus lately brought into extensive use in the leading hotels of New York and other cities of the United States, and also in the magnificent Atlantic steamers of Collins's line. It has thus been described in 'Novelties, Inventions,' &c.:—'There is an upright case or box, two or three feet square, through the top of which descend bell wires from all the rooms placed in connection with the apparatus. Within the case is a bell, the hammer of which is moved by pulling any of the wires; but this is not all, for at the instant the bell is struck a small white semi-circular plate in the front of the machine is turned half round, and reveals the number of the room whence the bell was rung, or the message to be delivered. There are 80 or 100 of these plates, and may be any number more or less; each has either a number or a word or two written so as to be concealed and revealed by it alternately; the numbers are those of the rooms, while the words are such as 'Waiter,' 'Boots,' 'Hot Water,' and others indicating the daily wants of hotel and cabin visitors. One bell serves for all; and when this bell is heard, one of the little plates will be found to be moved so as to reveal the message. There is internal mechanism to connect each wire with its appropriate number-plate, and also with the bell. A small handle at the bottom of the plate re-adjusts all the plates. It is obvious that, by numbering and inscribing the plates accordingly, such a bell apparatus might be adapted to mercantile and warehousing establishments.'

BELLINGHAM, JOHN. On the 11th of May, 1812, this individual shot Mr. Perceval, then Prime Minister of England, as he was entering the lobby of the House of Commons, at about a quarter past five. The assassin was a merchant, and during a visit to Russia had been rather unceremoniously treated by the Russian government, whereupon he applied to the English ministers to interfere in his behalf. The case was examined and dismissed by them, and Bellingham then sought the aid of Mr. Percival. The latter refused to interfere, and Bellingham determined to take revenge, which he did in the manner described. He was tried at the Old Bailey, on the 15th of May, sentenced to death, and executed at Newgate on the 18th of the same month.

BELLMAN, THE. It was a very olden custom for a bellman to perambulate the streets at night, and in our own country this functionary was superseded by the watchman, as the latter has given way to the new police. Stow says each ward had 'a bellman, who, especially in the long nights, went through the streets and lanes ringing a bell, and saluting his masters and mistresses with some rhymes suitable to the festivals and seasons of the year, at the same time bidding them look to their lights.' The latter admonition referred to the lanterns which the citizens were bound to hang out before their doors for lighting the streets. The bellman of course carried a bell, was usually attended by a dog, and chanted verses, many of which are preserved as curiosities. These guardians of the night still exist in other countries; and the following extract from W. Hurton's 'Voyage from Leith to Lapland in 1850,' will give our readers a good idea of the manner in which the bellmen and watchmen performed their duties:—

'During the past year of 1849, it has been my lot to reside at four of the most remarkable capitals of Europe, and successively to experience what spring is in London, what summer is in Paris, what autumn is in Edinburgh, and what winter is in Copenhagen. Vividly, indeed, can I dwell on the marvellous contrast of the night aspect of each; but one of the most interesting peculiarities I have noticed in any of them, is that presented by the watchmen of the last-named. When I first looked on these guardians of the night, I involuntarily thought of Shakspeare's Dogberry and Verges. The sturdy watchers are muffled in uniform great coats, and also wear fur caps. In their hand they carry a staff of office, on which they screw, when occasion requires, that fearful weapon, the "morning star." They also may sometimes be seen with a lanthorn at their belt; the candle contained in the lanthorn they place at the top of their staff, to relight any street lamps which require trimming. In case of fire, the watchmen give signals from the church towers, by striking a number of strokes, varying with the quarter of the city in which the fire occurs; and they also put from the tower flags and lights pointed in the direction where the destructive element is raging. From eight o'clock in the evening until four o'clock in the morning, all

the year round, they chant a fresh verse at the expiration of each hour as they go their rounds. The cadence is generally deep and guttural, but with a peculiar emphasis and tone; and from a distance it floats on the still night air with a pleasing and impressive effect, especially to the ear of a stranger.' The verses in question are of great antiquity, and were written, I am told, by one of the Danish bishops.'

Thus does the traveller find in other countries usages and customs that have been suffered to die out at home. (*Notes and Queries.*)

BELLOT, LIEUTENANT JOSEPH RENÉ. This gallant French officer was born at Paris, in 1826. At fifteen he was admitted into a naval school, and at nineteen was engaged in an expedition against Tamatave, where he distinguished himself so greatly, that he was made Chevalier of the Legion of Honour. He afterwards joined in the expedition that sailed to the Arctic regions in search of Sir John Franklin, and in 1853 joined the *Phœnix* steamer under the command of Captain Inglefield. On the 8th of August he volunteered to convey the Admiralty despatches to Sir Edward Belcher, and in this perilous undertaking he lost his life. With two seamen he got separated from his companions on what is called a hummock, and though the sailors were ultimately rescued, the gallant officer disappeared through a crack in the ice. A monument was erected, on Beechey island, to his memory, with the following inscription—'Sacred to the memory of M. Bellot, lieutenant in the French navy, and Chevalier of the Legion of Honour, who accompanied Mr. Kennedy and Captain Inglefield on their respective visits to the Arctic regions. Whilst attached to H.M.S. Phœnix under Captain Inglefield, he gallantly volunteered to convey despatches to Captain Sir E. Belcher, with a sledge crew from H.M.S. North Star. In a heavy gale of wind, on the 8th of August, 1853, he was drowned by the disruption of the ice near Cape Grinnell, much lamented by the Arctic squadron and all who had the pleasure of knowing his value and noble spirit.' So much was this gallant young French officer respected in England, that a subscription, amounting to nearly £2000, was collected to do honour to his memory. Of this sum £500 was expended on a monument, and the remainder given to his sisters, of whom, when alive, he had been the chief support. The memorial is an obelisk of colossal size, which has been erected in front of the Royal Hospital at Greenwich. It is a handsome shaft made of Aberdeen granite, with the name of Bellot cut on the pedestal, and can be distinctly seen by all persons passing up and down the river.

BELUS, TEMPLE OF, one of the most stupendous and magnificent edifices of all antiquity, as described by Herodotus, Strabo, Diodorus, and others. It was built by Semiramis, Queen of Babylon, in honour of Belus, one of the most ancient kings of Assyria, who was afterwards revered as a god, under the name of Bel, or Baal, and this vast temple was devoted to his worship. Such was its great extent, that its base was half-a-mile in circumference, and its height one furlong. It consisted of eight towers, built one above the other, decreasing regularly to the top, for which reason Strabo calls the whole a pyramid. It is not only asserted, but proved, that this tower much exceeded the greatest of the pyramids of Egypt in height. The ascent to the top was by stairs on the outside round it; that is, perhaps there was an easy sloping ascent in the side of the outer wall, which, turning by very slow degrees in a spiral line eight times round the tower from the bottom to the top, had the same appearance as if there had been eight towers placed upon one another. In these different stories were many large rooms, with arched roofs supported by pillars over the whole. On the top of the tower was an observatory, from the advantages of which the Babylonians became more expert in astronomy than all other nations.

The treasures of this temple, in statues, tables, censers, cups, and other sacred vessels, all of massy gold, were immense. Among other images there was one forty feet high, which weighed a thousand Babylonish talents. According to the calculations which Diodorus makes of these riches, the sum total amounts to upwards of twenty-one millions sterling.

This temple stood till the time of Xerxes; but he, on his return from his Grecian expedition, demolished it entirely, after having first plundered it of all its immense treasures. Alexander, on his return to Babylon from his Indian expedition, purposed to have rebuilt it; and in order thereto, set ten thousand men to work to remove the surrounding rubbish; but after they had laboured therein two months, Alexander died, and that terminated the intention.—(Herod. l. i.; Diod. l. ii.; Strab. l. xvi.)

BENEFI'CIARII, a name given to the Roman soldiers on whom were bestowed the conquered lands on the frontiers of the empire, which were distributed among them as rewards for their services. These lands were called *beneficia*, as being held on the pure beneficence of the sovereign. Though at first only given for life, they afterwards became hereditary and patrimonial. In the Middle age these kind of tenures passed into France and England; and hence, doubtless, the term *beneficia* became applied to church livings, as arising from the beneficence of princes or nobles.

BENGAL, PRESIDENCY OF (iii. 172-81). The following table exhibits the divisions, area, and population, according to the most recent returns:—

Divisions.	Sq. Miles.	Population.
Bengal Presidency . .	325,652	47,258,320
Upper Provinces (late Agra Presidency) . .	85,571	23,800,549
Berar	76,432	4,650,000
Provinces conquered from the Burmese under the Bengal Presidency, Assam, &c.	78,870	14,657,500
Total	566,525	90,366,369

The upper provinces of Bengal are under a lieutenant-governor at Agra, subordinate to the governor-general at Calcutta. The principal accessions of territory made to this extensive Presidency may be dated thus:—Benares, in 1775; Oude district, 1801; Delhi, 1805; Kumaon, 1815; Nerbudda (S. W. districts), 1818; Singapore and Malacca, 1824; Burmese provinces, 1826; Berar, 1853. The entire Presidency comprehends a vast variety of races—Hindoos of all castes, Moguls, Mahrattas, Sikhs, Rajpoots, Mughs, Garrows, &c. The prevailing religions are the Brahminical and Mohammedan; Budhism is confined to the countries east of the Brahmaputra; and the hill tribes have different kinds of paganism. The Roman Catholic religion is under the vicar apostolic of Agra, and a legate at Calcutta, both subordinate to the Roman Catholic bishop of Madras. The Protestant establishment consists of an archdeacon and about forty chaplains, all subordinates to the bishop of Calcutta. On the whole, it may be safely said, that at the present time no portion of our vast Indian territories enjoys a larger share of freedom, tranquillity, and happiness, than the important Presidency of Bengal.

BENTINCK, GENERAL LORD WILLIAM CAVENDISH, Governor-General of India. This distinguished officer and diplomatist was the son of the Duke of Portland, and born in 1774. He entered the army when very young, and on the expulsion of the Bourbons from France, he accompanied the Duke of York from the Netherlands, in the capacity of aide-de-camp. His lordship afterwards proceeded to Egypt, being appointed to command the cavalry of the expedition under Lieutenant-General Sir Ralph Abercrombie; but that campaign was terminated before his arrival. In 1803 Lord William proceeded to India, as Governor of Madras, and remained in that high situation until October 1807, when he returned to Europe. He was afterwards selected to proceed on an important mission to the Supreme Junta of Spain. At the Battle of Coruña his lordship particularly distinguished himself. He was next appointed to command a division of Sir Arthur Wellesley's army, with the local rank of Lieutenant-General. After his return to England, Lord William remained comparatively inactive until 1826, when he was selected for the highly honourable post of Governor-General of India, which he held for seven years. His rule was of an enlightened character, largely contributing to the intellectual advancement of the people. He gave practical freedom to the press, encouraged education, put down the frightful rites of Suttee, established a medical college for the instruction of the natives in the European Science, promoted commerce and agriculture, and husbanded the resources of the country. He also energetically devoted himself to the establishment of a regular steam communication with India. He died, however, before the great scheme, to which he applied his talents and influence, could be carried into operation. (*Military Encycl.*)

BENTINCK, LORD GEORGE, a British statesman of considerable ability, a major in the army, and an energetic member of the House of Commons. He was the second son of the Duke of Portland, and born in 1802. He entered Parliament in 1828, as member for Lyna Regis, which place he represented to the time of his death. He was at first a moderate Whig, but afterwards became a Tory. He voted in favour of the principles of the Reform Act, but opposed ministers on several of the details in committee. He afterwards became a Tory, and opposed Sir Robert Peel's measures in favour of free trade. He was opposed to the principle of the ballot, and to short parliaments. His death took place very suddenly in 1848.

BERDIANSK, a seaport town in South Russia, at the mouth of the small river Berda, on the north shore of the sea of Azoff, about 150 miles N. E. of Simferopol. There are coal mines and salt lakes in the neighbourhood. On the 27th of May, 1855, Captain Lyons attacked this place, destroyed several vessels, together with corn stores to the value of £50,000, bringing away an eight-inch gun from one of the wrecks. In the autumn of 1855 the place was again visited by Commander Osborn, when more corn and forage were destroyed.

BEREANS, the name of a Protestant sect of Dissenters from the Church of Scotland. They were founded by the Rev. Mr. Barclay at Edinburgh in 1773, and received the name of Bereans from the inhabitants of Berea, who were highly commended for their Christian conduct in 'searching the Scriptures daily,' as mentioned in the 'Acts of the Apostles.' This sect soon afterwards established themselves in the parish of Fettercairn, in the parish of Kincardine; and since that time they have found converts in all the principal towns in Scotland, London, and many other places of England, as well as the different states of America. The Bereans agree with the great majority of Christians respecting the doctrine of the Trinity, which they hold as a fundamental article of the Christian faith. They also agree with the Scotch Calvinistic church respecting predestination and election; but they differ from the majority of all sects of Christians in various minor details, which the members themselves consider as 'important particulars,' especially as regards our knowledge of the Deity, faith in Christ, sin against the Holy Ghost, &c. They consider infant baptism as a divine ordinance instituted in the place of circumcision; and they commemorate the Lord's supper but once a month; but they reject the word *sacrament*, as commonly applied to this ordinance and baptism. As to discipline, their church is neither Presbyterian nor Independent, but a mixture of both. They reject patronage, and with regard to ordination, while the people elect, a minister judges of the qualifications, and they consider one minister only as competent to ordain. With respect to the admission of members, their plan is simple. When any person, after hearing the Berean doctrines, professes his belief in the truths of the Gospel, as taught by the sect, and desires to be admitted into their communion, he is cheerfully received upon his profession before the church,

whatever may have been his former manner of life; because all men, as they affirm, before they believe the Gospel are dead in trespasses and sins. While recommending subjection to lawful authority, they do not think that any man, by becoming a Christian, or joining their society, is under any obligation, by the rules of the Gospel, to renounce his right of private judgment, upon matters of public or private importance.' (Adam's *Religious World.*)

BERESFORD, MARSHAL VISCOUNT, G.C.B., a distinguished military commander during the Peninsular war. He was born in 1768, and entering the army in 1785 he passed rapidly through the grades of lieutenant, captain, and major. He served, during the earlier part of his career, at Nova Scotia, Toulon, and Corsica. In 1799 he proceeded to India, as lieutenant-colonel of the 88th. When General Baird was sent to Egypt, with a force of 6,000 men, to co-operate with Abercrombie, Lieutenant-Colonel Beresford commanded a brigade. In January 1800 he rose to the rank of colonel by brevet; and after serving in Ireland, at the Cape of Good Hope, and in America, he was appointed, in 1807, colonel of the 88th, and governor and commander-in-chief at Madeira. Thence he proceeded to join the army in Portugal, accompanied Sir John Moore into Spain; and after the celebrated retreat from Coruña he covered the embarkation of the troops. When it was subsequently determined to raise and discipline a large body of Portuguese troops, General Beresford was appointed to undertake the task of instructions, with the rank of marshal and commander-in-chief. His judgment and unwearied perseverance enabled him rapidly to accomplish the object entrusted to him. The Portuguese troops became highly efficient. In the attack of the French in the north of Portugal, Marshal Beresford commanded 12,000 men; and while Wellington crossed the Douro at one point, Beresford crossed it at another, forcing back General Loison upon Amarante, and afterwards pursuing him in conjunction with Lord Wellington.

Amongst the battles in which Marshal Beresford commanded in chief, Albuhera stands conspicuous, though a more sanguinary fight is not on record. In consequence of this victory the Marshal was created a peer, by the title of Baron Beresford of Albuhera, and parliament voted him an annuity of £2000, with reversion to the two next inheritors of the barony.

In 1814 Lord Beresford entered and took possession of Bordeaux, and in 1815 commanded the second corps of the allied army at Waterloo. After the declaration and establishment of peace he received the appointment of governor of Jersey; and in 1825 he was made a full general, and appointed colonel of the 16th foot. He died in January 1854.

BERGIA, a genus of plants (so called in honour of Dr. Bergius), of the class and order Decandria Pentagynia, and natural order Elatinaceæ. The calyx is parted with five petals, and contains numerous seeds. There are two species, both natives of the Cape of Good Hope.

BERKSHIRE (iii. 222). According to the census of 1851, the entire population of the county was 170,065, of which 84,927 were males, and 85,138 females. Of houses, inhabited and uninhabited, there were 34,878. The population of the principal places was as follows:—

Abingdon ..	5,954	Maidenhead ..	3,607
Bray	2,250	Newbury ..	6,574
Clewer	3,997	Reading ..	22,456
Cookham ..	2,013	Wallingford ..	8,064
Cumnor ..	1,048	Wantage ..	2,951
Faringdon ..	2,456	Windsor ..	9,596
Hungerford ..	2,255	Wokingham ..	2,272
Lambourn ..	1,258		

BERLIN (iii. 227–31). According to the census of May 1852, the population amounted to 441,931; that of 1846 being 408,502; thus showing an increase of 32,429 in the present population. [PRUSSIA.]

BERLIN (iii. 227), CONVENTION OF, a treaty between Napoleon and the King of Prussia, November 5th, 1808, by which the former agreed to withdraw the principal portion of his troops, and to relieve Prussia from the payment of some heavy tributes.

BERLIN DECREE. After the battle of Jena, October 14th, 1806, Prussia was entirely at the mercy of Napoleon. On the 21st of November he issued at Berlin this celebrated decree. It interdicted all commerce and correspondence between the countries under his government and Great Britain. England was by the same document declared to be in a state of blockade, and English property was liable to seizure, and all ships touching at any port in England, or in an English colony, were excluded from the harbours of France, and those of the countries under its control. (Dr. Russell's *History of Modern Europe.*)

BERMUDAS (iii. 232). According to the returns of 1851, the population was 11,092; that of 1842 being 8,624. There is now a regular steam communication between Bermuda and New York, and Bermuda and St. Thomas; and, on the whole, the colony may be said to be progressive.

BERN, CANTON OF (iii. 233). Since 1839, when the population was about 408,000, a gradual increase has been taking place. According to the return of 1851, it was 457,921. It is the largest canton of the Swiss confederation, and holds the second rank in the federal diet. Its contingent to the army is 5824 men.

BERRI, DUKE AND DUCHESS OF. Charles Ferdinand, Duke de Berri, second son of the Count d'Artois, and nephew of Louis XVIII. was born at Versailles on the 24th of January, 1778. On the 17th of June, 1816, he married Maria Carolina, daughter of the Queen of Naples. The duke was assassinated at the opera, at Paris, on the 14th of February, 1820, being the last day of the Carnival, by a political fanatic, named Louvel. In 1832 his widow endeavoured to get up an insurrection in La Vendée in favour of the elder branch of the Bourbons. She was, however, taken prisoner, and in the castle of Blaye gave

birth to a daughter; whereupon she confessed that she had contracted a secret marriage with Count Palli, a Neapolitan nobleman. This strange issue of the affair led to the total decline of the little influence she once possessed; and on her recovery, in 1833, the French government sent her, with her child and suite, on board a French frigate, to Palermo. (Dr. Russell's *History of Modern Europe;* new edition, Geo. Routledge & Co.)

BERTRAND, GENERAL, COUNT HENRY GRATICA, a distinguished French general who shared the exile of Napoleon Bonaparte at St. Helena. He fought under his great leader in all his campaigns, and acted a brilliant part at Spandau, Friedland, Lutzen, and Bautzen; but all his military achievements were eclipsed by his fidelity and devotion to his imperial master during his long captivity. He was born in 1770, and died in 1844.

BERWICKSHIRE, in Scotland (iii. 262). According to the census of 1851, the population of the county was 36,297; and that of the principal towns was as follows:—

Dunse	3,437	Lander	2,154
Greenlaw ...	1,378	Coldstream	pa. 3,245
Eyemouth ...	1,488	————	... t. 2,238

BERZELIUS, BARON, the celebrated Swedish chemist, to whom the important science of chemistry is indebted for the discovery of several new elementary bodies. He was born in 1779, in Ostgothland, a province of Sweden, where his father kept a village school. After the usual routine of juvenile education, he graduated at Upsala in 1804. He afterwards repaired to Stockholm, where he became assistant to Professor Spawrnmann, who had been one of the fellow-voyagers of Captain Cook round the world. On the death of Spawrnmann, which took place in 1806, young Berzelius was appointed his successor in the chair of chemistry, which position he continued to hold for 42 years. During this long period his patient labours and ingenious researches have done more to lay the foundation of organic chemistry than those of any other professor. In fact he distinguished himself as a star of the first magnitude in the regions of science. To him belongs the honour of applying the great principles which had been established by Davy, Dalton, Gay-Lussac, and himself; and of demonstrating the laws which regulate the combinations that form the structures of the animal and vegetable kingdoms. By these investigations he opened the way for the important discoveries of Liebig, Mulder, Dumas, and others. To him chemistry is indebted for the discovery of selenium, thorium, cerium, and other bodies; and to his skill as a manipulator may be traced many of the analytical processes at present in use. In such repute was he held by the scientific world, that he was enrolled a member of nearly all the leading institutions in Europe; and the minor honours which he received at various times from his own sovereign, were finally crowned by his being made a knight grand cross of the order of Vasa in 1812, and of being elevated to the rank of a baron in 1835. He died, full of fame and honours, in 1848.

BESIKA BAY. This bay is situated on the coast of Asiatic Turkey, at a short distance from the entrance to the Dardanelles. Orders for the sailing of the French and English fleets to this anchorage were issued on the 2nd of June, 1853. On the 31st of the previous month Count Nesselrode announced the Czar's intention of crossing the Pruth.

BESLE'RIA (so called in honour of Basil Besler), a pretty and interesting genus of plants, of the class and order Didynamia Angiospermia, and natural order Gesneriaceæ. There are twelve species, the principal of which are *B. cristata*, with stalks growing single and a five-leaved involucrum, the calyx being scarlet, and the corolla yellow; the *B. lutea*, with simple footstalks growing in clusters, and spear-shaped leaves, the flowers being yellow; *B. melittifolia*, with branching footstalks and oval leaves. They are all natives of America; and in this country are hothouse plants.

BESSIERES, MARSHAL JEAN BAPTISTE, DUC D'ISTRIA, one of the distinguished soldiers of fortune who owed his elevation to the military career and genius of Napoleon Bonaparte. Bessières was born at Preissac, in 1768. In 1792 he entered the French army; and in two years reached the rank of captain. When the French Directory sent their forces into Italy, Bessières was appointed commander of the Corps of Guides, in which capacity he attracted the attention of Napoleon Bonaparte. He rapidly rose to distinction. In September 1796 he was *chef-d'-escadron;* two years later he became *chef-de-brigade*, in which capacity he held the command of the consular Horse Guards. In July 1800 he became general of brigade, and was appointed to the head of the consular cavalry. His services in Italy and Egypt recommended him to further promotion, and accordingly, in 1802, he was raised to the rank of general of division.

When Napoleon, as emperor, created several of his best generals Marshals of France, Bessières was not forgotten. In 1808, and again in 1811, he served in Spain, receiving for his services, in the first of these years, the title of Duc d'Istria. In 1809 he was general-in-chief of the army of the north. Napoleon made him governor of Strasburg in 1810; and in 1812 he was appointed to command the cavalry of the Imperial Guard during the campaign in Germany. He fell at the battle of Lützen, on the first of May, 1813. (*Military Encyc.*)

BESTIA'RII, were combatants among the Romans, who either fought with beasts voluntarily for hire, or were compelled by way of punishment, as was frequently the lot of the first Christians. The former consisted of young men, who, to become expert in managing their arms, fought sometimes against beasts, and sometimes against one another. The latter were slaves or condemned criminals, who were sometimes exposed naked, and without defence, to the beasts. Cicero mentions a lion which alone despatched 200 bestiarii.

BETHAM, SIR WILLIAM, genealogist and Ulster King of Arms of all Ireland, keeper of the Parliamentary Records, and one of the most

indefatigable genealogical writers of the time in which he lived. He was born at Stratford, in Suffolk, in 1779, and was the son of the Rev. W. Betham, author of 'Genealogical Tables of Sovereigns of the World,' &c. The subject of our memoir was originally bred to the business of a printer in London; but, entertaining his father's taste for antiquarian pursuits, he undertook the revision of Camden's 'Britannia' under Mr. Gough; and about the year 1805 he went to Dublin as clerk to Sir Chichester Fortescue (then Ulster King of Arms and Athlone pursuivant). Mr. Betham was found so effective in the department which he had hitherto filled, that in 1809 he was appointed Deputy-Ulster. In 1812 he received the further appointment of Genealogist Attendant on the Order of St. Patrick, on which occasion he obtained the honour of knighthood from the Lord-Lieutenant. He was also appointed Deputy-Keeper of the Records of the Wardrobe Tower at Dublin Castle. On the death of Sir Chichester Fortescue, in 1820, Sir William became Ulster King of Ireland. All these appointments, however, were more honorary than profitable; and the chief of his emoluments appears to have been derived from the researches made in what he called his 'private collections of references to records,' which (as he says) 'he had collected and compiled for the last thirty years with almost incredible labour and application, which consisted of many hundred volumes, all methodized, indexed, and rendered easy of reference in every possible way.' Sir William's greatest manuscript work, however, was his Index to the names of all persons mentioned in the wills at the Prerogative Office in Dublin. This work was begun in 1807, and not completed till 1828; during the greater portion of which period he devoted to it from eight to ten hours a day. In the year 1825 Sir William was elected a member of the Royal Irish Academy, and shortly afterwards he became its secretary for foreign correspondence, as well as an active member of the council on the committee of antiquities.

In 1826 and 1827 Sir William published a series of detached papers under the title of 'Irish Antiquarian Researches; or, Illustrations of Irish History.' In 1830 he brought out his work on "Dignities, Feudal and Parliamentary, and the Constitutional Legislature of the United Kingdom;" and in 1834 a volume entitled 'The Origin and History of the Constitution of England, and of the Early Parliaments of Ireland' —a work which has been held in the highest estimation for its clear and accurate conception of our early constitution. He afterwards published several works of an archæologico-philological character, such as 'The Gael and Cymbri,' 'Etruria Celtica,' &c.; but these being too much of a speculative character, were not deemed generally satisfactory to the matter-of-fact portion of his readers.

In the general absence of an Irish aristocracy Sir William's name and influence were in continual request. Either as president, vice-president, or director, his name graced the lists of almost every public body, and he was always ready and delighted to render every assistance in his power to deserving objects. His death took place in October 1853.

BETH'LEMITES, the name of a religious order in the thirteenth century, the members of which wore a red star, with five rays, upon their breast, called the star of Bethlehem.

BETTING-HOUSES. A few years since a number of betting-houses sprang up in the metropolis, which were thus described by the Attorney-General, in his speech in House of Commons, on the 11th of July, 1853. 'The course now was to open a house, and for the owner to hold himself forth as ready to bet with all comers. The mischief arising from the existence of these betting-shops was perfectly notorious. Servants, apprentices, and workmen, induced by the temptation of receiving a large sum for a small one, took their few shillings to these places; and the first effect of their losing was to tempt them to go on spending their money, in the hope of retrieving their losses; and for this purpose it not unfrequently happened that they were driven into robbing their masters and employers. From 100 to 150 of these establishments exist in the metropolis alone, while a great many have sprung up in the large towns of the provinces.' The bill for their suppression received the royal assent on the 20th of August, 1853; and these dens of iniquity were immediately closed. The evil was still carried on in another form in private houses; and in the session of 1854 a bill was brought in, giving increased facilities to the authorities for dealing with offenders. This measure received the royal assent on the 24th day of July, 1854. Its effects have been most beneficial.

BEXLEY, LORD (RT. HON. NICHOLAS VANSITTART), Chancellor of the Exchequer, and a statesman of some political celebrity. He was the son of Mr. Henry Vansittart, Governor of Bengal, who was lost at sea when Nicholas was only four years old. He was educated at Cheam, in Surrey, and afterwards went to Christ Church, Oxford, where he took his degree of A.M., and was called to the bar in 1791; but his success as a member of the bar was very indifferent. In 1796 he was returned to Parliament as the representative for Hastings; and in 1802, through the influence of Lord Addington, he became member for the rotten borough of Harwich, and afterwards for Old Sarum, which he represented till 1823. In 1804 he was made a lord of the Treasury, and on the death of Mr. Perceval he was appointed to the post of Chancellor of the Exchequer, which he held possession of till 1822. He was next created Baron Bexley, and appointed Chancellor of the Duchy of Lancaster, which office he held till 1828. After that period he interfered very little with public affairs; but enjoyed a pension of 3000*l.* a year charged on the consolidated fund. He was connected with most of the great institutions of the country, of some of which he was president. He died in 1850.

BIDAL, sometimes spelt BIDALE (*bid* and *ale*), an ancient custom, still kept up in certain

localities. It is an invitation given by friends to drink ale at some poor man's house, and there to contribute for his relief.

BIDDERY WARE, a peculiar kind of articles manufactured in great variety by the Hindoos at *Bider*, a town about 60 miles from Hyderabad, and in other parts of India. The material is a compound of copper, lead, and tin, in the proportions of eight, four, and one. The process of preparing the metal for use is by melting it in a crucible, with a little resin and bees-wax, and then pouring it into a mould of baked clay, which brings the article to its pristine rude form. Then the processes of turning, inlaying, and ornamenting commence. The implements they chiefly use are a sharp-pointed steel tool and small chisels of various shapes. The articles made from this metal comprise vases, cups, dishes, ewers, boxes, and numerous other varieties. The advantage of biddery is, that it does not rust, nor does it break unless violently struck.

BIFORINES (Lat. *biforis* double-cased), a term applied to those oval perforated sacs which are found in the pulpy part of the leaves of certain plants, and consist of two coats. The interior sac is full of fine spiculæ, and the space between the bags is filled with transparent fluid. These biforines exhibit some curious phenomena. When placed in water the biforine discharges its spiculæ with a degree of violence, first from one end and then from another. It recoils at every discharge, until it is entirely emptied, when it becomes a motionless flaccid bag. (Craig.)

BILLIARDS. Certain captious critics will never forget that in Anthony and Cleopatra (Act ii. 5), Shakspeare makes Cleopatra invite one of her attendants to this game. 'Let us to billiards,' says the Egyptian queen; and as this was many years before the game had been invented, the poet was guilty of a terrible anachronism. In Bohn's 'Handbook of Games,' we find the following account of this interesting game:—'Billiards, like the greater number of games which are prevalent in modern Europe, is of French invention. Soon after, the French, the Germans, the Dutch, and the Italians brought it into vogue throughout the Continent; and, in a few years afterwards, it became a favourite diversion in England, particularly among persons of rank. The precise period of its introduction into this country is not known; but as it is mentioned by Shakspeare, the game must, at least, have been somewhat familiar to us in the sixteenth century. As it is replete with entertainment, and attended with that kind of moderate exercise which renders it, at the same time, both agreeable and conducive to health, it will, in all probability, long remain in fashion. 'The game of billiards is played by two or more persons, with ivory balls, upon a table, which, in different countries, is made of different shapes. In some parts of the Continent a round or oval form is most in use; in others, nearly a square one; in this country the shape universally employed is the oblong, varying in size from six to twelve feet long, the width being always half its length. But the established table is twelve feet long by six wide (supported on eight legs), the height three feet from the ground to the top of the cushion; and this size is adopted in all our public rooms. Two or three ivory balls are the usual number employed—one red, the others white. The instruments employed for the purpose of striking the balls are two—the cue and the mace. Of these instruments the cue is by far the most universally used.'

BILLINGSGATE. Stowe, on the authority of Geoffrey of Monmouth, says, 'that it was built by Belin, a King of the Britons, whose ashes were enclosed in a vessel of brass, and set upon a high pinnacle of stone over the same gate.' In 1676 John Boydall mentions it as a wharf or quay for ships. It is said to have been made a free market in 1669. The new edifice was opened in 1849; and increased facilities, in the means of communication and the conveyance of fish, have rendered it the first market of the kind in the world.

BIMA'NA (Lat. *two-handed*), a name given by Cuvier, Hamilton, Smith, and others, to the first order of the animal kingdom, consisting of the one genus and one species *Homo*, man; who, in contradistinction to the Quadrumana, has been physiologically described as possessing hands on the fore limbs, with opposable thumbs; a peculiar structure of the pelvis and feet, by which he is enabled to support an upright position; a difference in the form of his teeth and the adaptation of the organs of speech for articulated sounds; and, above all, in the superior magnitude and organization of his brain, and the number of its convolutions. Although the Bimana, or human species, appears to be unique, we may observe certain hereditary conformations which constitute what are called races, the principal of which may be divided into the Caucasian, Mongolian, and Nigritian. The Caucasian, or white race, to which we Europeans belong, is distinguished by the beautiful oval form of the head, in the complexion, and in the general colour of the hair. It is this race of the Bimana that has given birth to the most civilized people of the world, and to those who have generally ruled over others. The Mongolian race is recognised by its projecting cheek bones, which are on a line with the nose, flat face, narrow and oblique eyes, straight and black hair, thin beard, and olive complexion. It has formed the great empires of China and Japan, and has sometimes extended its conquests on this side of the great plains of Asia; but its civilization has always been of a stationary character. The Nigritian, or Ethiopian race, is confined to the south of the great Atlas mountains. Its compressed skull, flattened nose, thick lips, and receding forehead, have an approximating resemblance to the Simia family, over which some of the barbarian tribes in the interior of Africa appear to possess very little superiority.

Besides these three great races of the genus *Homo* there are several anomalous ones on the face of the earth, whose origin is involved in obscurity, as the Malayan, the Australian, the Tasmanian, the Polynesian, the American Indian, the Hyperborean, and others.

BINARY ARITHMETIC, a kind of arithmetical notation invented by Leibnitz for the more expeditiously discovering the properties of numbers and the constructing of tables. All the characters used in it are 0 and 1, and the cipher multiplies everything by two, as in common arithmetic by ten. Thus 1 is one; 10, two; 11, three; 100, four; 101, five; 110, six; 111, seven; 1000, eight; 1001, nine; 1010, ten, and so on.

BIPEL'TATA (Lat. *bis* double, and *pelta* a shield), in zoology, a family of Crustaceans, which belongs to the order Stomapoda. The shell is divided into two shields, as the name implies; the anterior part of which is very large, and forms the head of the habitant. The posterior part, which corresponds to the thorax, is transverse and angular in its circumference, and supports the feet and foot-jaws.

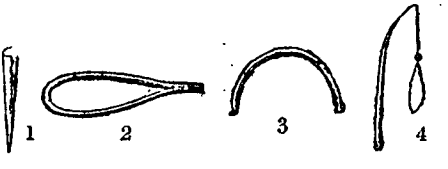
BIRCH, SAMUEL, Alderman and Lord Mayor of London, who for many years played a distinguished part in metropolitan politics. He was born in 1757, and succeeded to his father in his well-established business as a pastry-cook in Cornhill. He was the first to propose the measure of arming and training the inhabitants as volunteers, and had the honour successively to become lieutenant, major, and lieutenant-colonel commandant of the first regiment of Loyal London Volunteers. In 1814 he had the honour of being called to the civic chair as Lord Mayor, which important position he filled with energy and hospitality. Although a decided party man, and almost constantly involved in the stirring politics of the day, he found leisure to employ his pen in the pursuits of literature. He was also among the earliest and most active supporters of the Literary Fund Society, to which he continued attached to the very last period of his existence, having long been the senior member of its council. He died in 1841.

BIRD-CATCHING is the art of ensnaring the winged denizens of air, through the agency of nets, traps, springs, limed twigs, decoys, and other devices. The nets in ordinary use are about twelve yards long, and two and a-half wide, which are spread on the ground at such a distance that when turned over they may coincide. The remaining apparatus consists of lines so fastened to the nets that the fowler is able to draw the net over the birds that alight between the parallel sides. These birds are enticed by others, termed 'call-birds,' which are generally linnets, goldfinches, woodlarks, yellow-hammers, or bullfinches. On observing the wild birds, the decoys begin to sing, and the former, alighting within twenty yards of the bird-catchers, are easily caught. Sometimes a curious additional contrivance is practised for the capture of larks. A few small pieces of looking-glass are fixed to a piece of wood placed in the middle of the net, and set into a quick whirling motion by a string which the lark-catcher commands. The lark is attracted by the glittering reflection of the bits of glass, and drops down to within a few inches of them, when the larker, watching his opportunity, pulls up, and the bird very rarely escapes capture.

Birds are also caught in traps, and frequently by nooses of hair; great numbers of wheatears, woodcocks, and snipes are caught in this way. The common brick-trap, consisting of four bricks and an inner perch, is a very simple contrivance for entrapping the bird, but too familiar to require description. The sieve-trap is another simple mode of catching the bird. It is nothing more than propping up one end of the sieve with a stick, and suddenly plucking it away by the string to which it is attached when the bird is pecking its food.

Wild ducks are taken by means of decoys. Bullfinches are easily caught all the year round by the decoy-bird, with limed twigs, or in winter by a noose with the berries on which the bird usually feeds suspended from it. The nightingale is frequently caught by a sort of trap composed of a board and purse-net, which, by means of an elastic spring, falls when the bait is seized, in the same manner as the lid of a common cage-trap. Grouse and partridges are ensnared by nets, particularly in the night. Pheasants are sometimes taken in the night by holding flaming sulphur under the trees where they are at roost, when the suffocating effluvium causes them to fall down senseless. Larks are frequently caught by what are called *springes*: a line, twelve or fifteen yards in length, with a horse-hair noose fixed at every six inches of its length, is pegged down to the ground, and a few oats sprinkled along it. The larks, pitching down to get at the oats, become entangled in the horse-hair noose attached to the line, and are readily caught. In the fenny counties a modification of this plan is adopted for the capture of woodcocks and snipes. Small barriers, formed of stocks and stones or the tops of brooms stuck in the ground, are made across the wet furrows of a field, with openings here and there, while horse-hair nooses are placed near these openings. The birds, finding a passage through the openings, are generally ensnared by the noose, and thus easily captured.

Among the various contrivances for ensnaring the bird, the *springle* may be considered as the most effective, although it is rather a complicated contrivance. It consists of four different parts: (1) the stump; (2) the spreader; (3) the bender; and (4) the springer.



The setting of the springle is thus described by the editor of that very amusing work, 'Every Boy's Book:'—'The stump is first driven firmly into the ground, and the spreader is placed around the stump, so that its bight is in contact with it. The bender is fixed in the ground at about the length of the spreader from the stump. The thick end of the springer is now fixed in the ground at a little distance from the bender, and the small

end of it bent down till one end of the catch is placed upwards and on the outside of the bender. The spreader is now raised about an inch from the ground, and the small end of the catch is put into the notch. The horse-hair slip-knot is now arranged loosely round the bender, and the trap is set.

THE SPRINGLE.

'A little seed is now scattered within and around the spreader, when the bird, attracted by the bait, soon perches upon the spreader, which falls, owing to its own weight. The catch of the springer being thus set at liberty, the springer flies up, and the bird is caught either by the legs, wings, or body, by the horse-hair noose or slip-knot.'

Such are the various modes by which the ingenuity of man contrives to entrap the unwary tenants of the air.

BIRMAN EMPIRE, or BURMAN (iii. 339-346). In 1852 the Burmese, by their hostile spirit, brought themselves into collision with the British. The country was invaded, and after the British had captured Rangoon, Martaban, and Bassain, and stormed Pegu, his Burmese Majesty was compelled to sue for peace, and to cede a large tract of territory, which once formed the important kingdom of Pegu before it became subject to the Birman empire.

BIRMINGHAM. Within a very few years this great manufacturing emporium has been making rapid strides in the industrial arts. Her population, which in 1801 was only 60,822, had increased in 1851 to 238,841. Her manufactures now comprehend almost every description of metallic goods, and all kinds of machinery. In 1849 the steam-engines employed in her factories were supposed to have an aggregate power of 5,500 horses, and to consume 380 tons of coals daily; and the annual value of her manufactures has been estimated at upwards of four millions. It is computed that 20,000 families are employed in manufactures, trade, and handicraft. Among the manufacturing establishments is the vast steam-engine factory at Soho, the largest in the world, and with which the name of the celebrated Watt is associated. The wages of the artizan, moreover, are higher in Birmingham than in most of the manufacturing towns of the north of England; and his condition, both in a moral and sanitary view, reflects credit on this enterprising locality. It is stated that upwards of 10,000 of its inhabitants are members of friendly societies, thus showing the general prudence of the industrious classes of Birmingham. All the manufacturing prosperity is attributable, not only to the immense coal and iron beds of the district, but to her extensive means of communication by canals and railways with every portion of the empire, from which London and all the great towns of the north of England are brought within a few hours' journey. The great London and Birmingham railway was commenced in 1834, and completed in 1838, at an expense of 5,500,000*l*. By means also of the Grand Junction Railway, Birmingham has rapid communication with Liverpool, Manchester, Warrington, and Stafford; and thus her trade, commerce, and general prosperity are annually increasing.

BISHOP, SIR HENRY ROWLEY, Mus. *Doc.*, and Professor of Music in the University of Oxford. He was born in London in 1786, and his principal musical instructor was the opera composer, Signor F. Bianchi. His taste for music was exhibited at a very early period. At twenty years of age he composed the music of a ballet which was produced at Covent Garden; and in two years afterwards the music for the pantomime ballet of 'Caractacus' was brought out at Drury Lane. His fame now began to be established, and in 1809 he publicly took his place as composer of operas, by contributing to Drury Lane his 'Circassian Bride,' which was distinguished for much taste; but unfortunately ere it could be played a second time the theatre was burnt down, and the musical score was destroyed with the building. From that period he wrote incessantly for the two great theatres; producing melodramas, operas, burlettas, and various incidental pieces. Besides stage music, he composed ballads, glees, and canzonets in abundance. In 1810 he was appointed director of the music at Covent Garden, which post he retained till 1824. In 1826 he brought out the opera of 'Aladdin,' in rivalry to Weber's 'Oberon;' but it was a failure, and with this it may be said his theatrical career was terminated; but he was for many years the director of the concerts of ancient music. In 1839 the University of Oxford conferred upon him the degree of Doctor of Music, and in 1842 he received from the Queen the honour of knighthood. On the death of Dr. Crotch, in 1848, he was elected honorary Professor of Music at Oxford, and retained this post till the time of his death, which took place in 1855.

Notwithstanding the talents which Sir Henry Bishop exhibited to the world as a musical composer, and the success of many of his pieces ('Guy Mannering,' 'Maid Marian,' 'The Miller and his Men,' &c.), he died in comparative poverty; and after his demise a public subscription was set on foot for the relief of his destitute family.

BLACK, DR. JOHN, many years editor of the *Morning Chronicle*. He was born in 1783, near Dunse, in Berwickshire. He was the son of a labouring collier, and before he was twelve years of age became an orphan. He was educated at the parochial school; and at the age of fourteen was engaged as errand boy in a factor's office in his native town. At eighteen he went to Edinburgh, and found employment at a stationer's, and soon afterwards gained admission to the offices of two or three writers of the *Signet*, where he contrived to acquire a knowledge of the classical and modern languages. At the age of twenty-seven he travelled on foot to London, where he arrived with only three halfpence in his

pocket! He brought letters of introduction to Mr. Perry, the proprietor of the *Morning Chronicle*, who engaged him to translate the foreign journals, and to take his turn as a reporter in the 'gallery.' After various changes in the management of the paper, Mr. Black was eventually appointed principal editor about two years before Mr. Perry's death, which occurred in 1821. Amidst all the changes and transfers of the *Chronicle*, Mr. Black continued to hold the same office without interruption until 1844—nearly one-third of a century. In fact, the history of his connection with the *Chronicle* is the political history of Whiggism, and of the principal characters and events of the time. He formed a wide circle of literary and political associates, and personally knew every leading liberal of the time. He retired from the management of the paper in 1844, under circumstances which excited some regret among the liberal party. He was then compelled to dispose of his library; with the proceeds of which, and the contributions raised from among the leaders of the liberal party, he was enabled to purchase a small annuity, on which he retired into private life. He took up his residence at Birling, in Kent, at a little cottage, with a piece of land, granted by his friend Mr. Coulson at a nominal rent. Here he lived during the latter years of his life in rural ease, and died in 1855.

BLACK HOLE, CALCUTTA. On the taking of Calcutta by Rajah al Dowlah, on the 18th of June, 1756, Mr. Hollwell and 145 of his fellow countrymen were thrust into the common dungeon of Fort William, usually called *the Black Hole*. These unfortunate men were condemned to pass the night, in one of the hottest climates of the world, and at the hot season, in a dungeon only 18 feet square. The only air they received was through two small gratings, almost entirely blocked up by the neighbouring buildings. A fearful scene ensued; the wretched captives struggling one against the other to obtain a station near the narrow aperture. When the door was opened on the following morning, only 23 were found alive out of the 146 that had been thrust in the night before. At this juncture the affairs of the English in Bengal had reached the lowest ebb; but on the 1st of January, in the ensuing year, Calcutta was retaken by Watson and Clive, and Rajah al Dowlah compelled to sign a treaty of peace. He was afterwards defeated at the battle of Plassy, and put to death by a native officer. (Dr. Russell's *History of Modern Europe*, New Edition, Routledge and Co.)

BLACK-LEAD DUST (iii. 391). The black-lead mines of Borrowdale in Cumberland, being in a state of rapid exhaustion, an ingenious substitute has been devised by a Mr. Brockedon, which has been attended with considerable success. He has thus managed to convert the Plumbago from Borrowdale into a valuable material. We find the process thus briefly described in 'Novelties, Inventions,' &c. 'The dust is placed in packets, and is then pressed with a force of almost inconceivable amount, five thousand tons. The air is first withdrawn from between the particles by an air-pump, and the pressure then forces them to cohere into a perfectly solid mass, from which pencil leads can be cut as easily as from solid plumbago.'

BLACK MONDAY, Easter Monday, so called from that day, the 14th of April, or the 34th of Edward III., being remarkably dark and cold. While the British troops lay before Paris, so dreary and black was the day, that many of the soldiers died on horseback from cold.

BLACK SEA (iii. 393). A violent hurricane occurred in the Euxine in June 1838, in which twelve Russian vessels and two steamers were lost, and about a dozen more seriously injured. The Circassians attacked some of the stranded vessels, and after having plundered them set them on fire.

The allied squadrons of France and England made their first entrance into the Black Sea, during the late war, on the 4th of January, 1854. The following are the principal events in that occupation:—

	1854.
Odessa bombarded	April 22.
The Tiger, war steamer of 1,200 tons, lost	May 12.
Forts at the Sulina mouth of the Danube attacked by Captain Hyde Parker	June 26.
Captain Hyde Parker killed in capturing a stockade	July 8.
Landing of the armament at Old Fort	Sept. 14-18.
Balaklava entered	Sept. 26.
First bombardment of Sebastopol by the fleet	Oct. 17.
Terrible gale	Nov. 11.
Hurricane in which the *Prince, Rip Van Winkle, Resolute, Kenilworth, Henri Quatre, Fulton*, and other vessels, were lost	Nov. 14.
Allied expedition to Kertch, sailed May 3, recalled	1855. May 5.
Allied expedition to Kertch, sailed	May 23.
And after capturing several places, destroying forts, ammunition, and vessels, and leaving a strong force to hold Kertch and Yenikale, returned	June 14.
French and English expedition to the mouths of the Bug and the Dneiper, anchored off Odessa	Oct. 8.
Detained by fog and contrary winds to	Oct. 14.
Kinburn captured	Oct. 16.
Timber rafts taken	Oct. 25.

The expedition returned to the camp in November, and the restoration of peace early in the following year led to the gradual withdrawal of the allied fleets. (Dr. Russell's *History of Modern Europe*, New Edition, Routledge and Co.)

BLACK SEA, RUSSIAN PREPONDERANCE IN THE. At the Vienna conferences three schemes were proposed, by which the menacing preponderance of Russia might be effectually removed. These were,

I. Neutralisation. To be effected as follows:—

1st. That Russia and Turkey should have no ships of war in the Black Sea, nor in the Sea of Azoff, excepting some few small vessels for the purpose of sea police to prevent piracy; and that as regarded the Sea of Marmora and the Bosphorus, an understanding should be come to with the Porte, with a view to ascertain whether the Porte would not be willing to include those waters in the arrangement, if it should be necessary to do so, in order to obtain the consent of Russia to the application of the principle of neutrality to the Black Sea and the Sea of Azoff.

2nd. That the ports of the two Powers, in the Black Sea and the Sea of Azoff, should be solely commercial ports.

3rd. That foreign Powers should be allowed to have consuls in those ports.

4th. That there should be no menacing assemblage of troops by either Power on the shores of the Black Sea.

5th. That the allied Powers (England, France, and Austria) should have the right to send their naval forces into the Black Sea, if the provisions of the treaty should be violated.

6th. That the two Powers (Russia and Turkey) should have the right to maintain a fixed number of light vessels for the police of the Black Sea, and unarmed transports exclusively adapted for the conveyance of troops.

II. Limitation of the naval force of Russia. This scheme was as follows:—

1st. That Russia and Turkey should each of them maintain in the Black Sea, and in the Sea of Azoff, no more than four sail of the line and four frigates, with a proportionate number of light vessels for police of those seas, and of unarmed transports exclusively adapted for the conveyance of troops; and that the same limitation should apply to the naval force which Turkey should maintain in the Bosphorus and in the Sea of Marmora.

2nd. That England, France, and Austria, should each be permitted to maintain half that number of ships in the Black Sea; that is to say, two sail of the line, and two frigates, and some smaller vessels for each of the three Powers, if they should think fit so to station them. Russian ships of war not to be allowed to enter the Bosphorus, nor to pass through the straits into the Mediterranean.

3rd. That, in case of danger to Turkey, and on the demand of the Porte, all the naval forces of England, France, and Austria should be allowed to enter the Black Sea to assist in defending the Turkish empire.

4th. That the contracting Powers should be allowed to have Consuls at all the Russian and Turkish ports in the Black Sea, and in the Sea of Azoff.

III. Counterpoise. This was an Austrian proposition, brought forward in various forms. The following is a summary of the chief points of the different proposals:—

1st. The High Contracting parties severally engage to respect the independence and territorial integrity of the Ottoman empire, and in case of a difference, before resorting to arms, to endeavour to settle the matter by pacific means.

2nd. The treaty of July 13, 1841, respecting the closing the Straits of the Bosphorus and the Dardanelles, shall continue in force, with the exceptions specified in the following articles:—

3rd. Each of the contracting parties, which has no establishment in the Black Sea, will be authorised, by a firman from his Highness, to send into and station in it two frigates or vessels of smaller force, in order to protect their commerce, and to exercise the necessary inspection.

4th. If Russia should increase the amount of her naval forces at present afloat, as duly defined, the Contracting Powers, who do not possess an establishment in the Black Sea, would be authorised by a firman of his Highness (a previous warning of five days being given), to send respectively into that sea an additional number of vessels of the same class, equal to one-half of the naval forces of Russia.

5th. At no time will ships of war of foreign nations be allowed to anchor in the Golden Horn, with the exception of the small vessels hitherto admitted belonging to the Embassies; and, in time of peace, the number of ships-of-the-line of the Contracting Powers, which have no establishments in the Black Sea, must never exceed four at a time before Constantinople, on their way from the Dardanelles to the Black Sea, and from the Black Sea to the Dardanelles.

6th. In the event of the Sultan being menaced with aggression, he reserves to himself the right of opening the Straits to all the naval forces of the allies.

The arrogance of Russia, in 1855, caused the rejection of all these modes of the solution of the difficulty; the latter of which was also objected to by the English Government. Russia proposed to open the Straits of the Bosphorus and of the Dardanelles to ships of war of all nations, and thus obtain an entrance into the Mediterranean.

The last conference was held on the 26th of April, 1855; but in less than a year the fall of Sebastopol, and other events, had humbled Russia, and she accepted terms which she had before rejected with indignation. — (*Parliamentary Papers.*)

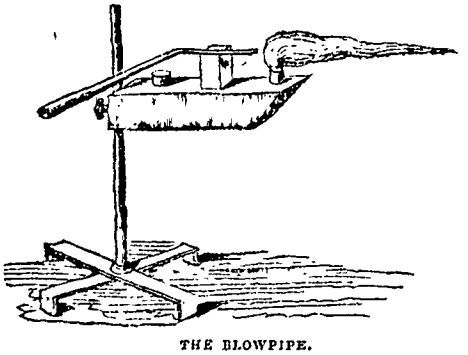
BLANCH FIRMS. In feudal times the crown rents were sometimes reserved in libris albis, or blanch firmes: in which case the buyer was holden dealbare firmam, viz.:—his base money or coin, worse than standard, was molten down in the exchequer, and reduced to the fineness of standard silver; or instead thereof, he paid to the king 12*d.* in the pound by way of addition.

BLARNEY, a small village in the parish of Garrycloyne, County Cork, Ireland. The population does not amount to quite 300. The surrounding scenery is beautiful, and has been made the subject of song. The 'blarney stone,' the kissing of which is said to impart that peculiar kind of eloquence called 'blarney,' for which the natives of Ireland have long been celebrated, is still shown in the castle, although some difference of opinion exists as to which is really the wonderful stone.

BLESSINGTON, MARGARET POWER, COUNTESS OF, celebrated for her literary talents and graceful accomplishments. Her ladyship was born in 1789, in the county of Wexford. At the early age of fifteen she contracted an imprudent marriage with Captain Farmer; and soon after his death the Earl of Blessington sought and obtained her hand in 1818. After her marriage she passed several years abroad, by which she had the opportunities of associating with the most distinguished personages in Europe. It was then she formed an acquaintance with Lord Byron, which enabled her to give to the world one of her most interesting works, her 'Conversations with Lord Byron.' On the death of her husband, which occurred in 1829, she took up her residence in London, where her house became the great nucleus of literary and fashionable society. Indeed there were few literary celebrities, whether native or foreign, who did not share in the festive hospitalities of Gore House. In the midst of all her fashionable coteries, however, she did not neglect the pursuits of literature. Her pen appears to be constantly at work, and for many years she conducted, with great talent, the beautiful annuals known as 'The Keepsake,' and 'The Book of Beauty.' She also published several novels, of which 'Grace Cassady, or the Repealers,' 'The Two Friends,' 'Meredith,' 'Stratherne,' 'The Lottery of Life,' and 'The Victims of Society,' were the principal. She likewise presented to the world several works replete with personal anecdotes, sentiments, epigrams, and descriptions; such as the 'Idler in Italy,' 'The Idler in France,' 'Memoirs of a Femme de Chambre,' 'The Belle of the Season,' &c. In short, there was scarcely another woman of the present age, in whom literary industry and fashionable accomplishments were so happily combined. The latter portion of her days was spent at Paris, where she died, in 1849.

BLOOD-DRINKING. This was at one time supposed to invigorate the old, and Louis XI. is said to have imbibed the blood of infants for the purpose of recruiting his failing powers.

BLOWPIPE (iii. 451). We have already spoken of the application of this important instrument to scientific purposes, and of the powerful modifications contrived with jets of oxyhydrogen, by means of which the most refractory substances, when submitted to its influence, may be fused.



THE BLOWPIPE.

We shall now examine a few of the phenomena resulting from the action of oxyhydrogenic heat on Acids, Minerals, Oxides, Earths, and Alkalies; first premising that the substance on which the flame of the blowpipe acts is called the *assay*. Thus we find, by experiment, that the presence of *sulphuric acid* is detected by fusing soda and silica into a globule, and then, after placing the assay upon it, heating them together in the flame of the blowpipe. The acid is reduced, and the sulphuret of soda is formed. The glass assumes a dark brown tint, or it becomes red or orange during cooling. For the detection of *muriatic acid*, the oxide of copper is to be fused with salt of phosphorus into a dark green globule. The assay is then to be added. If muriatic acid be present the globule is surrounded by a fine blue flame approaching to purple during the application of heat; and this appearance will continue so long as the assay gives off any of the acid. *Nitrates*, if fusible, detonate with charcoal; but if infusible they must be heated to redness in a tube closed at one end. We shall then find that nitrous gas is given off, and converted by atmospheric contact, into nitrous acid gas, which appears in the form of an orange-coloured vapour. The presence of *phosphoric acid* is detected by the assay being fused with boracic acid. The globule is removed from the charcoal on which it is melted by inserting the end of a fine wire in it, and then heating it in a good reducing flame. If the assay contains phosphoric acid, the iron of the wire is oxidated at the expense of the acid, and a borate of protoxide and phosphuret of iron is produced. If no phosphoric acid is contained in the assay, the steel wire, just mentioned, will only burn at the ends which project beyond the globule.

The pyrognostic character of Mineral oxides is a subject of too extensive a nature to enter upon in this place; but it will be interesting to notice the mode of experiment on two or three of the well-known gems, and the deductions which may be drawn from the phenomena they exhibit. Thus the *diamond*, notwithstanding its extreme hardness, may be reduced by the blowpipe to a mere mass of charcoal. To effect this, a strong heated blast must be kept in action for a considerable time; but we apprehend that few will be induced to make the experiment on a very valuable brilliant! *Emerald* fuses with borax into a colourless, transparent glass. The chrome-green emerald produces a green-tinted glass. *Garnet* fuses on charcoal into a black globule, with some appearance of reduced iron on the surface. *Topaz* does not fuse on charcoal. With borax, however, topaz fuses slowly into a transparent glass; and becomes white and opaque before its solution. With salt of phosphorus it is slowly dissolved, and leaves a skeleton of silica.

The action of the blowpipe, in detecting the presence of the Earths, presents some interesting phenomena; but our knowledge of this subject can only be acquired by practical observation and repeated experiment. Thus *silica*, which is found to be a very refractory substance, undergoes no change under the blowpipe; while with soda

it fuses into a clear glass, a brisk effervescence taking place during the process. With borax, also, silica fuses slowly, and with considerable difficulty, into a transparent body. *Caustic lime* is unchanged by the action of heat; but the carbonate becomes caustic, and emits a brilliant white light. With the salt of phosphorus lime fuses into a clear glass, and even when cold retains its transparency. *Magnesia* and *alumina* are infusible, and do not change under the blow-pipe. *Barytes* does not fuse until it has received a little water, when the hydrate fuses, bubbles, intermixes, and at last solidifies. With salt of phosphorus it fuses, and when the intumescence thence arising subsides, it is found a transparent body. Borax produces similar results. *Strontites* presents the same phenomena as Barytes; and its characters, with the salt of phosphorus and borax, are entirely alike. The carbonates of these bodies, on being re-heated, have an alkaline reagency; for when the carbonic acid is driven off, the caustic earth presents its alkaline characters.

As to the Alkalies, they do not present any very marked characteristics under the action of the blow-pipe. Whether pure or carbonated they redden turmeric, and discharge the red colour given to litmus paper by an acid. *Potass* and *Soda* unite with silica under the heat of the blow-pipe, and produce a transparent vitreous globule. *Ammonia* may be recognised by the pungent smell which it evolves when heated with caustic potass.

Varieties of blow-pipes have been invented of late years; one by Newman, in which the high temperature we have mentioned was obtained by a mixture of hydrogen and oxygen gases. But the valuable treatise on the subject is that by Berzelius, which has been published with copious notes.

(Professor Silliman's *Inorganic Chemistry*, &c.)

BOARDS (iii. 467). Independently of the various Government Boards, for the transaction of official business, there are several connected with the military departments,—the principal of which are: the *Board of Ordnance*, Pall Mall, for the management of all affairs relating to the artillery, engineers, barracks, garrisons, &c.;—the *Consolidated Board* of general offices, located in Spring Gardens, London, for the inspection and regulation of the clothing and appointments of the army, &c.;—the *Regimental Board*, which consists of any number of officers, assembled by order of the commanding officer of a regiment, for the purpose of investigating and reporting upon such matters as may be legally submitted to their consideration; and the *Army Medical Board*, in Berkeley Street, Piccadilly, for the regulation of medical appointments, the supply of medicines, surgical apparatus, &c. (*Military Encyc.*)

BOCCA TIGRIS, the name of the entrance to the river Canton, in China. Some forts in this part were destroyed by a small military and naval force, under the command of General D'Aguilar and Captain M'Dougall, of Her Majesty's steam frigate Vulture, on the 2nd of April, 1847, and successful operations were carried on for several days. These places were also again attacked in the renewed hostilities towards the end of 1856. See the article CHINA.

BOCCIUS LIGHT, the name of a new light, which produces a brilliant illumination through the agency of an improved combustion of gas. It was so called from M. Boccius, the inventor and patentee. In the construction of the light he applies two or three concentric cylinders, or chimneys, to the jet-holes of the burners, in addition to the usual glass chimney. The diameter of the innermost chimney is so contrived, that all the flames enter that chimney, and thus present one strong and concentrated body of light.

BODIES, NATURAL. The matter which constitutes this terraqueous ball is usually divided into four classes, or bodies; viz. solid, liquid, aëriform, and imponderable; and the exact nature of these bodies is ascertained by analysis or synthesis. By the former process we are enabled to effect the decomposition of a compound body, and thus acquire a knowledge of the nature of its ingredients. This decomposition, in chemical language, means the art of dividing a body into its simple elements; and chemists have not only the power of decomposing natural bodies, but of producing, by certain combinations, various other substances; some of which are not to be found in the great kingdom of nature. But, in order to ascertain the precise character of bodies, the chemist has often recourse to synthesis as well as analysis. Thus, whenever the component parts of any body are re-united, in order to form a similar substance, and this substance is actually produced, the nature of that body is said to be proved by synthesis. When a body admits of being examined in both these ways, the demonstration is considered as satisfactory.

The nature of the different bodies just specified, may be thus illustrated:—When cohesive affinity between the particles of a body is strong, that body is a solid; but when the affinity is considerably diminished by heat, the body becomes a fluid. When sufficient heat is applied to destroy the cohesion altogether, the particles of the body begin to repel each other, and thus an aëriform vapour or gas is formed. The moleculæ, or ultimate particles of matter existing in these separate states, are so infinitely small as to escape the cognizance of our senses. When we have reduced matter to the most impalpable powder, we are probably very far from arriving at the atoms which compose that powder. In illustration of this, we may refer to the experiment of Dr. Thomson, who has shown that a molecule of lead cannot weigh more than the 1-310,000,000,000th part of a grain, nor an ultimate molecule of sulphur more than the 1-2,015,000,000,000th part; and that the size of the molecule of lead cannot exceed the 1-888,492,000,000,100th part of a cubic inch.

But to revert to the different divisions of our subject:—*Solidity* is that quality of bodies whereby their parts firmly cohere, and has been thus explained by the celebrated French chemist, Lavoisier. 'The particles of bodies may

be considered as subject to the action of two opposing powers, repulsion and attraction, between which they remain in equilibrio. So long as the attractive power remains stronger, the body must continue in a state of *solidity*; but if, on the contrary, heat has so far removed these particles from each other as to place them beyond the sphere of attraction, they lose the cohesion they before had with each other, and the body ceases to be solid.' In conformity with these explanations, it has been laid down as a universal law in nature, that 'the mutual attraction of two bodies increases in the same proportion as their masses are increased, and as the square of their distance is decreased; and also the mutual attraction decreases in proportion as the masses of the bodies are decreased, and as the square of their distance is increased.' These laws are universal, and not only extend to the utmost limits of the universe hitherto explored, but to every form and condition of matter, without exception.

Sir Isaac Newton has laid it down as an axiom that the primary particles of all bodies are hard, whether solid or fluid; and that if the particles be so disposed or fitted to each other as to touch in large surfaces, such body will be hard; otherwise it will be soft. In fact, the force of cohesion in solid bodies increases in proportion as their moleculæ are brought nearer together. Thus alumina, which shrinks considerably in bulk by being submitted to a high degree of heat, not only experiences great mechanical cohesion, but thereby acquires the power of resisting alkalies and acids. The adamantine spar and the diamond are the two hardest bodies with which we are acquainted, and yet the chemical nature of the one is constituted of the same material as common pipe-clay; while that of the diamond is perfectly similar to carbon, to which it can be reduced by the heat of the blow-pipe [BLOW-PIPE, *Supplement*].

Liquid or *Fluid* bodies are nothing more than solids converted into liquids by heat. Indeed we have reason to believe that every solid substance on the face of the earth might be converted into a fluid, or even a gas, were it submitted to the action of a very high temperature in peculiar circumstances. Recent experiments have tended to throw considerable light on this subject. Many bodies which were formerly deemed infusible, have proved to be so only in consequence of the decomposition they suffered in the usual way, in which they were submitted to the action of caloric; but by means of a pressure sufficiently strong to prevent the escape of the volatile parts of the substance (such as the carbonic acid from calcareous earth, &c.), the later chemists have succeeded in fusing limestone, chalk, and even marble. But let us take mercury as an instance. When it is at a temperature of 29° below zero of Fahrenheit, it is a solid body. In our climate it is a semi-fluid; but if it be heated to 660° it becomes volatalized, and converted into vapour.

Liquids may be defined as those bodies whose parts do not cohere firmly, but readily yield to any impression, and have freer motion among themselves; though we have no reason to suppose that fluidity is an essential property of any liquid substance whatever; but rather that solidity is the natural state of all bodies; for we are able to reduce most substances to a state of fluidity by the combination of caloric. The distinctive property of liquids, however, is, that when in small masses they assume the spherical form, as may be observed in detached portions of mercury, and are incapable of being reduced to a smaller compass by mechanical pressure.

In the present condition of our globe, the number of liquids bears but a small proportion to that of solids. Thus, if we except water, and the numerous compounds of which it forms the principal ingredient, there are very few others in the great kingdom of nature.

Aëriform bodies are those elastic fluids which are usually called vapours and gases. They are all capable of being reduced into a smaller compass by pressure, and of expanding again to their usual volume, whenever the pressure is removed. Thus atmospheric air may be so compressed that 128 volumes may be forced into the space of one volume, and the greater the compression the more will its elasticity be increased. It is on this principle that the air-gun is constructed.

Bodies in the vaporous or gaseous form may be classed under two heads—vapours, of which steam, or the vapour of water, is illustrative; and gases, or airs, of which atmospheric air may be considered as the most striking. Vapours are generally the results of higher temperatures, and under ordinary circumstances are capable of only a partial existence. Most of the gases preserve their fluidity at the general temperature of the globe. Some gases, however, assimilate to vapours so nearly in their properties as to be connectable by pressure into liquids; as, for example, the gaseous product of the combination of charcoal, carbonic acid gas. It is also the property of vapour, that the divellent molecular force exceeds the attractive. Thus water, on being converted into steam, assumes so expansive a range as to occupy no less than 1700 times its original volume.

The *Imponderable* or Etherial bodies constitute the fourth class in the material world, and are so called from their light and etherial nature. They are four in number, viz.—Light, Caloric, Electricity, and Magnetism; to which the reader is referred, as well as to the articles AIR and ATMOSPHERE.

(Prout's *Bridgewater Treatise*; Berthollet's *Chemical Statics*; Thomson's *Inorganic Chemistry*; Lavoisier's *Chemical and Philosophical Miscellanies*, &c.)

BOGOMILI, or BORGOMITÆ, a Christian sect of the 11th century, supposed to be a branch of the Manicheans. They denied the Trinity, and maintained that God had a human form, and that the world was created by evil angels. They rejected the Pentateuch, and only admitted seven books of Scripture, with many other strange doctrines. Their leader Basil was burnt alive by order of the emperor Alexander Comnenus.

BOLGRAD. By the 20th article of the Treaty of Paris it was provided, with reference

to the Russian and Turkish frontiers, that, 'The new frontier will start from the Black Sea at one kilometre to the east of Lake Bourna Sola, will perpendicularly rejoin the Akermann road, follow this road as far as the valley of Trajan, pass to the south of Bolgrad, re-ascend along the river Yalpuck, as far as Saratsika, and will terminate at Yakamori, on the Pruth. Above this point the old frontier, between the two empires, will undergo no modification.'

This boundary line was, after the signature of the treaty, found to be impracticable. It cut in two Lake Hadji-Ibrahim, and left Lake Basiriam entirely to Russia. Moreover, Bolgrad, instead of being separated from Lake Yalpuck, as was indicated by the maps, touched its northern extremity. Hence arose numerous complications. The Austrians refused to evacuate the Principalities, and the English fleet remained in the Black Sea. The Emperor of France mediated, and a protocol was signed at Paris, on the 6th of January, 1857, between the plenipotentiaries of Austria, France, Great Britain, Prussia, Russia, Sardinia, and Turkey, by which all differences were removed. On the same day Lord Cowley communicated to the English government the settlement of the difficulty, which he described as follows:—

'The arrangement proposed by the Emperor of France, while it maintains inviolate, by assigning both New and Old Bolgrad to Moldavia, the principle on which Article XX. was originally framed, of removing Russia from all communication with the Danube and Lower Pruth, meets the desire of the Russian government to have a capital for the Bulgarian colonies which remain to Russia, by giving her the town of Komrat, on the Yalpuck. At the same time the wish expressed by Turkey, that the Delta of the Danube, of which she formerly was mistress, should be restored to her instead of being transferred to Moldavia, is acceded to, and the Isle of Serpents is declared to be an appendage of the Delta.' (*Parliamentary Papers*).

BOMARSUND, the capital of the Aland Isles, which were ceded to Russia by Sweden, at the peace of Frederickshamm, September 17, 1809. This group is situated at the entrance of the Gulf of Bothnia, between the coasts of Finland and Sweden, within a short distance of Stockholm. On Bomarsund, the largest of these islands, the Emperor Nicholas had commenced building fortifications, which, if completed, would have formed a standing menace to Sweden and Norway. The principal forts were four in number, and of these Fort Nottich was really a formidable work. The French and English squadrons in the Baltic, having received 10,000 French soldiers on board, under General Baraguay d'Hilliers, proceeded, in August 1854, to attack these strongholds. Fort Tzee surrendered to the French on the 14th of August, and Fort Nottich to the English on the 15th. This decided the fate of the Aland Isles, and the victors took 2235 prisoners, 112 mounted guns, 72 unmounted guns, seven field-pieces, and three mortars. Bomarsund was intended for a second Sebastopol, as the plans and documents that fell into the hands of the allied commanders fully proved. An English minister justly remarked:—'Bomarsund was a fortress to which, in a few years, Sweaborg and Cronstadt would have been as nothing; in its harbour, and under its guns, the whole fleet of Russia would have been able to lie in security. Had Bomarsund not been destroyed, in a few years the Gulf of Bothnia would have become a Russian lake, and Stockholm would at any moment have been at the mercy of Russia.' By a convention annexed to the Treaty of Paris, between England, France, and Russia, the latter power engaged that henceforward 'the Aland Isles shall not be fortified, and that no military or naval establishment shall be maintained or created there.'

BOMBA, KING. In answer to a query inserted in 'Notes and Queries' a correspondent of that periodical says:—'This name was given to the King of Naples by the Sicilians, after his bombardment of Messina; in which the slaughter and destruction of buildings were immense, and contributed, more than any act of the king's, to the hatred entertained against him in that island.'

BONE CAVERNS, a term applied by geologists to those limestone caves, or cavern rocks, which are found to contain masses of animal remains, and have been discovered in different parts of Europe. The account of the Kirkdale Cave, in Yorkshire, which was discovered in 1821, and examined by Professor Buckland, has been already fully described in its proper place. In this cavern there were the remains of twenty-three species of animals, and a vast abundance of hyenas' teeth; from which the learned professor inferred that the cavern, in primeval ages, was the den of hyenas for a long succession of years, and that the bones of other animals were the remains of those bodies which they dragged into the cave for food. [KIRKDALE CAVE.]

The existence of bones in caverns has always been viewed with great curiosity; but it is exceedingly difficult to determine when and how the caves were first formed, or when these organic remains were deposited therein. The account of these caves and their contents are extremely curious, and open a wide field for geological speculation. The limestone caverns of Germany, Hungary, Bohemia, and other places, have been celebrated for the vast numbers of bones and teeth of carnivorous animals, which have been there deposited; the most numerous of which are those of the hyena and the bear; the former often being one-third larger than any existing species; and the latter being as big as the horse. One of these caves, which was situated in the Lower Hartz, in the county of Holinstein, has been described by Dr. Ebræus. 'Here,' says he, 'were found the skulls, jaw-bones, shoulder-blades, back-bones, ribs, teeth, thigh-bones, and all other bones of men and beasts; and there were some like an unshapen mass or lump of stone, having no resemblance to any bone at all.'

These caves have also been found at Kühlosh, Scharzfeld, Bauman's Höhle, Gailenruth, Rabenstein, and numerous other places in Ger-

many; but the greater number of the bones found therein have been described as belonging to an extinct species of the ursine race. The accounts, however, given by the early German naturalists are often vague and unsatisfactory; and no philosophical deductions could be formed of the nature and origin of these interesting deposits, until Professor Buckland commenced his philosophical investigation of the organic remains of bone caverns, as illustrated by that of Kirkdale in Yorkshire; and since the publication of his 'Reliquiæ Diluvianæ,' the inquiry has assumed a more tangible shape, and acquired a new interest. The subject has occupied the attention of geologists, and though it may at present be involved in partial mystery, the time appears to be approaching when something like a satisfactory solution will be obtained. Sir Philip Egerton, who lately undertook the examination of the German caves, and especially those just mentioned, states, in a letter to Professor Buckland, that in all the caves he visited the bones of dogs, foxes, pigs, birds, and ruminant animals were found; and what is the most curious of all, in the Rabenstein Cave were found some old coins and ancient household iron implements of a rude shape. In the south of France, moreover, it appears that the remains of man, mingled with the bones of extinct animals, have been discovered.

From the vagueness of all these different accounts, and the deficiency of information as to the geological formations of the country around the caves, it is difficult even to guess, and almost impossible to determine their eras with any degree of certainty. Perhaps the best and most accurate account of these bone caverns is that given by M. de la Bêche, in his description of the one formed at the Oreston Quarries, near Plymouth. We shall therefore conclude these brief notices by citing his own description.

'At Oreston Quarries, Plymouth, clifts and caverns in limestone rocks have afforded numerous remains of the elephant, rhinoceros, bear, ox, horse, deer, and other animals buried, more particularly in the case of clifts, beneath considerable angular and smaller fragments of limestones. In one instance which I noticed, the animal remains occurred beneath ninety feet of such accumulations, the bones and teeth being confined to a black clay under the fragments. The remains of bears, rhinoceroses, hyenas, and other animals contained in the celebrated Kent's Hole, near Torquay, belong to the same district. In the superficial gravel of this part of the country, the remains of animals of the same kind as those detected in the caverns have not yet been discovered; but, if we continue our researches eastward, we shall find them in the valleys of Charmouth and Lyme; thus apparently giving these remains of elephants and rhinoceroses the same relative antiquity as those beneath fragments in the clefts of rocks near Plymouth, and probably also as those contained in the caverns at the same place, and at Kent's Hole. It will be remarked that the animal remains, which seem to imply a warmer climate existing at that time than at present, occur in low grounds, fissures, and caves. Upon the former they may have lived, and into the two latter they may have either fallen or been dragged by beasts of prey; the elephants probably browsing on branches and herbage, the rhinoceros preferring low grounds, the bears and hyenas inhabiting caves, and the deer, the ox, and the horse ranging through the forest and the plain, all which supposes land fitted for them, and therefore hill and dale, consequently valleys, were scooped out previously to the existence of elephants, and if a mass of water acting on the land destroyed these animals, it must have been influenced in its direction by the previously existing inequalities of surface.' — (Buckland's *Reliquiæ Diluvianæ*, &c.)

BONES. [Osteology, *Suppl.*]

BONES, FOSSIL (iii. 594–5). Since the publication of the article on Bones, as applied to manuring purposes, many important discoveries have been made with regard to the fertilizing properties of those fossil remains which have been imbedded in the geological formations of the earth's crust for some thousands of years. These petrified or silicified bones of animals of the primeval world have received the appropriate name of *Coprolites*, from two Greek words (κόπρος and λίθος) signifying 'manure stores.' They are of frequent occurrence in brown, gray, or blackish-green lumps of tolerable hardness, and are found to contain nearly as much phosphate of lime, or animal earth, as the bones of our domestic animals, which is more than fifty per cent. It was found, however, by Marchand, that the fossil bones of a trio of bears, found near the surface of the soil, contained only four per cent. of organic matter, while another, obtained from a considerable depth, contained above sixteen per cent.

The geological formation in which these bones are found is the upper green sand, which prevails to a considerable extent in the south and south-east of England, especially in Surrey, Dorset, Essex, Suffolk, &c. Thousands of tons (says the 'Journal of the Royal Agricultural Society') are annually dug up. These fossils were found in the upper green sand of Surrey, near Farnham. Through an investigation into the causes of the peculiar fertility of the soil at places where the certain formations were developed on the surface, practical farmers sought in vain for the causes of the difference of fertility in two adjoining strips of land, which were manured in the same way, and the soil of which was apparently the same. A chemical examination, however, revealed the important secret; for it demonstrated that the one soil contained very little phosphoric acid, and the other a considerable quantity. On digging downwards, however, there was found beneath the fertile strip of land a vein of green sand, thickly impregnated with fossilized remains of animals, by which the whole neighbourhood appeared to be fertilized. A similar bed of green sand fossils was lately discovered in the vicinity of Cambridge, only a few feet below the surface, which, on account of their hardness, were formerly used for repairing roads. At present, however, the owner of one little field, whence they are dug for manuring purposes, receives an annual stipend for

permission to remove these stones, or animal petrifactions, from his land.

The discovery of these coprolithic beds in England has induced researches in America, where extensive formations have also been found to exist.

According to the opinions of geologists, many thousands of years must have passed since the primeval possessors of these bones were buried in the earth. Nevertheless they contain gelatine; and the antediluvian broth, or phosphoric glue, can be extracted from them. By way of illustration, it may be mentioned that in Saxon Vorgtland, near Oelsnitz, large quantities of bones of the rhinoceros and elephant, and even entire skeletons of large animals, were some time ago discovered at the bottom of a clay-pit, although there was no historical record of such animals ever having existed in that quarter of the world. On the bones of these animals being heated, they became black, and diffused the same empyreumatic and ammoniacal odour as fresh bones. On a chemical analysis, one specimen yielded 2½ per cent. of nitrogen, which is equivalent to about 14 per cent. of gelatine; and allowing the composition of these bones to be similar to those of the present day, they appear to retain nearly half of their original quantity of nitrogen and gelatine.

In the dissolving of these fossil stones, the process is nearly the same as that which is adopted in the usual decomposition of bones, although the cost of phosphoric acid may be estimated at scarcely half the price to the agriculturist. After the bones are ground firm between granite mill-stones, the powder is dissolved in sulphuric acid. The material is then added to stable manure, and a rich compound is obtained. Sometimes the salts of ammonia are mixed with it, when it is allowed to be equal to the best guano in its fertilizing properties.

(*Journal of the Royal Agricultural Society;* Herapath's *Chemical Analysis;* Stockhardt's *Agricultural Chemistry, &c.*)

BOOKS. The Pentateuch of Moses, so far as our historical knowledge extends, is the most ancient in the world, and in profane literature the poems of Homer stand the next, although the names of others still more ancient are preserved. On the invention of letters, the leaves and bark of trees were in general use for writing, though various other materials have been adopted. Thus the decalogue delivered to Moses was written or engraved upon stone. Hesiod's works were originally written upon tables of lead; and Solon's laws upon planks of wood. Most of the terms, however, which appertain to books, in their primitive senses, mean the bark or rind of a tree, on which, doubtless, they were originally written; as the Greek *βίβλος*, the Latin *liber, codex, folium,* &c., and the Saxon *boc* (book). Thus Junius and others suppose that as *boc* denotes a beech-tree as well as a book, in the latter case it was used in reference to the material of which the northern nations first made their books; as *liber*, the inner part of a tree among the Latins, and *biblos*, an Egyptian plant among the Greeks, were the usual names for a book—these being the materials to which their earliest writings were committed. By degrees, however, the skins of goats and sheep were introduced, out of which parchment was eventually prepared; and most ancient manuscripts, written since the use of papyrus, are preserved on this article, though, at some periods, linen, silk, horn, &c. have been adopted.

From the sacred records we learn that the first books were in the form of blocks and tables under the appellation of *sepher*, square tables. Of this form the book of the Covenant, book of the law, book or bill of divorce, book of curses, &c. appear to have been. But when flexible material came to be written on, they found it more convenient to make their books in form of rolls, called by the Latins *volumina* (volumes), which appears to have been in use among the ancient Jews, as well as Grecians, Romans, Persians, and even Indians. The roll or volumes were composed of several sheets, fastened to each other, and rolled upon a stick, or *umbilicus;* the whole making a kind of column or cylinder, which was to be managed by the *umbilicus* as a handle. The whole volume, when extended, was about a yard and a half wide, and fifty yards long.

The art of glueing the leaves of books together, and rolling them on cylinders of wood, is first attributed to the Egyptians. It was continued till long after the age of Augustus, and is still retained by the Jewish synagogues, where they continue to write the books of the law on vellums sewed together; making, as it were, only one long page, with two rollers, and their clasps of gold or silver at their extremities; the whole book being wrapped up in a piece of silk which serves as a cover to it. But as this manner of binding books was attended with many inconveniences, one of the Attali, kings of Pergamus, invented the form now in use of square binding, or of sewing several quires one over another, as more commodious to the reader, who can open and shut his book in an instant without the leaves being exposed to wear out so soon as when rolled up, especially books written or printed on paper.

The traffic of books was anciently very inconsiderable; the book-merchants of England, France, Spain, and other countries, being only distinguished by the appellation of Stationers, as having no shops, but only stalls and stands in the street. During this state the civil magistrates took little notice of the booksellers, leaving the government of them to the Universities, to whom they were supposed to be more immediate retainers; who accordingly gave them laws and regulations, fixed prices on their books, examined their correctness, and punished them at discretion. But when, by the invention of printing, books and booksellers began to multiply, it became a matter of more consequence; and the sovereigns took the direction of them into their own hands, giving them new statutes, appointing officers to fix prices, granting licences, privileges, &c. Hence arose the establishment of Stationers' Hall for the registration of books. [STATIONERS' HALL.] (Nuttall's *Archæol. Dict.*, &c.)

For the general manufacture and mechanical

production of books, see PAPER-MAKING, PRINTING, and BOOK-BINDING.

BOOMERANG. In 'Every Boy's Book,' this instrument is described as, 'a curved piece of wood, flat on one side, and slightly rounded on the other. It is used by the natives of New South Wales, who can throw it so dexterously as to kill a man behind a tree, where he may have fled for safety. It should be held horizontally in throwing it, and cast by bringing the arm backwards; and after making a variety of curves it will come back again to the person who sent it. If skilfully thrown, it may be made to go in almost any direction the thrower pleases.'

BORDARII, in the feudal ages, the name of a certain class of agriculturists, frequently mentioned in Domesday, who were a distinct class from the villein, and appeared to be of a less servile position; for they had a cottage and small parcel of land allowed them, on condition that they should supply the lord with poultry, eggs, &c.

BORDLANDS (Sax.), in the feudal age, were demesnes which the lords of the soil kept in their hands for the maintenance of their board or table.—*Bordlode* was a service required of tenants to carry timber out of the woods of the lord to his house, and the term was also applied to the quantity of food or provision which the *bordmen* paid for their *bordlands*.—*Bord-half-peng* was a small toll formerly paid to the lord of a town for setting up boards, &c. in markets and fairs.

BOROUGHS, or BURGHS. All places which were called boroughs among our Saxon and Norman ancestors, were fortified, or fenced around. In the reign of Henry II. they had great privileges; and if a bondman or servant remained in a borough a year and a day, he was, by that residence, made a freeman. The freedom of buying and selling, without being subject to toll, &c., as granted by royal charter, was the reason why they were called Free Burghs, and the tradesmen thereof Free Burgesses. Parliament boroughs were generally by charter, or towns holden of the king by ancient demesne. [MUNICIPAL BOROUGHS, &c.] (*Glanville* and *Brady*.)

BOSCOBEL. In the Boscobel tracts this is said to be 'a very obscure habitation, situate in Shropshire, but adjoining upon Staffordshire, and lies between Tong Castle and Brewood, in a kind of wilderness.' The house was built by John Giffard, and named Boscobel by Sir Basil Brook, from the Italian *Bosco bello*, signifying 'fair wood.' Here Charles II. took refuge after the defeat at Worcester, September 3rd, 1651, and remained some days concealed in the house and the adjoining wood. The celebrated Boscobel oak, in which the king hid himself from a party of the rebels, stood on this estate.

BOSJESMANS, or 'BUSHMEN,' a diminutive and savage race of Hottentots, who inhabit the sides and valleys of the Nieuweldt Gebirgte and Sneuwberg—an inaccessible range of snowy mountains, which form the northern boundary of the colony of the Cape of Good Hope. Some specimens of this savage race were lately exhibited in London, and excited considerable interest among the ethnologists. They live in perpetual hostility with the colonists and neighbouring tribes, and frequently make irruptions into the colony; but from their mountainous situations and savage bravery they have been able to preserve their independence. They exhibit in excess all the deformities of the Hottentots, and are said to be among the ugliest of human beings. They, however, abhor a life of indolence, and their activity is incredibly great. From their weapons of war, their domestic utensils, and their various ingenious contrivances to catch fish and game, we may infer that they possess some mechanical ingenuity. But their huts are of a miserable description. They merely consist of a grass mat, bent into a semicircle about three feet high and four feet wide, with a hollow dug out in the middle, which appears to serve as their bed. They wear little or no apparel, the females only wearing a little belt of skin. They are neither pastoral nor agricultural, and accordingly raise neither cattle nor corn; so that, with the exception of what they can steal from their neighbours, they feed on a few roots, or the larvæ of ants and locusts.

BOTANY, CLASSIFICATION AND NOMENCLATURE OF (iii. 651–61). The necessity of classification, and the advantages of simplifying the nomenclature of science, are too manifest to admit of dispute; and of all the various departments of physical knowledge, perhaps that of botany stands most in need of these essentials. Indeed a clear understanding of the classification and terms of any science is a necessary preliminary to its practical study. This is the master-key by which the mystic portals of physical knowledge can be opened. Without this, science appears involved in a labyrinthian maze; but when the first difficulty is surmounted, the path becomes smooth and easy.

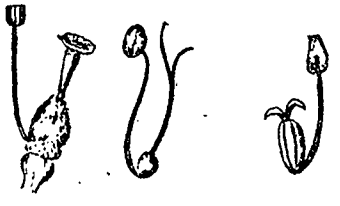
Before entering, however, upon the nomenclature of botany, and the best mode of simplifying its terms, we shall endeavour to elucidate the leading systems of classification which have been adopted by the learned, and which are necessary for the botanical student to comprehend. Of these a brief historical notice has been already given; in which the two principal systems, the sexual or artificial one of Linnæus, and that of Jussieu, according to the natural order of plants, are there mentioned, but without any explanatory details.

The Linnæan system is founded on the number, situation, and proportion of the essential organs of fructification denominated stamens and pistils. Thus the vegetable kingdom is divided by this great naturalist into 24 classes, of which 23 belong to flowering and one to flowerless plants. They are distinguished by their stamens, and are subdivided into orders, which are usually known by their pistils. The names of the classes and orders are of Greek derivation, and allude to the functions of the respective organs. The first 11 classes are distinguished entirely by the number of stamens, which are called monandria, diandria, triandria, &c. as far as dodecandria, from the Greek words one, two, three, &c., combined with *male* (ἀνδρία), because the stamens of flowers are compared to males, and the pistils to females. Hence the orders are denominated monogynia, digynia,

trigynia, &c. to polygynia, according as the flower has one or more pistils, so called from the Greek μόνη (one) &c. and γυνὴ a female. Thus the Jasmine, having two stamens, and one pistil, is placed in the second class, and the first order of that class, or diandria monogynia; while the lily, having six stamens and one pistil, is ranked as hexandria monogynia. With respect to the natural habits of these classes there is not any material difference. Thus in the third class (triandria) are found most of the natural order of grasses. The sixth class (hexandria) contains the lilies and many other bulbous plants, and is sometimes called Liliaceæ, or the lily tribe. The twelfth class (icosandria), which has twenty stamens or more growing out of the calyx, always contains edible or wholesome fruit; while the plants of the thirteenth class (polyandria) are generally poisonous. The fifteenth class (tetradynamia) comprehends the cruciform flowers, as turnips, cabbages, cresses, radishes, and stock gilliflowers. The forest trees mostly range under the twenty-first, twenty-second, and twenty-third classes (monœcia, diœcia, and polygamia). In the monœcia is the bread-fruit tree; and the diœcia comprehends the hop, the willow, the hemp, &c. In the twenty-fourth class (cryptogamia) are comprehended the fungi, the ferns, mosses, algals, or sea-weeds, &c. which apparently have no sexual development.

The following may be considered as a complete summary of the Linnæan system of classification, in which the number of stamens contained in each class are given, first, as they appear with the petals of the flowers in their natural state, and secondly, as they are seen when stript of their petals.

Class I. *Monandria*, one stamen.



MONOGYNIA. DIGYNIA.

This class contains two orders, monogynia and digynia. There are only two native plants found in it, viz. the glasswort (*salicornia*), and the mare's tail (*hippuris*).

Class II. *Diandria*, two stamens.

In this class are comprehended three orders—monogynia, digynia, and trigynia. It comprehends the privet, the speedwell, the gipsy wort, the meadow sage, the common lilac, and the garden vervain.

Class III. *Triandria*, three stamens.

It has three orders (monogynia, digynia, and trigynia), and includes the gramineæ, or grasses, which are very numerous. It also comprehends some very beautiful garden plants, as the iris, the crocus, the corn flag, and the red valerian; also the wild crocus, the purple and yellow flag, and some plants of the rush kind.

Class IV. *Tetrandria*, four stamens.

This class comprehends three orders (monogynia, digynia, and tetragynia), and in it may be found many well-known wild flowers; as the teasel, the lilac, the bed-straw, the madder, the sweet woodruff, the shining holly, and the dogwood.

Class V. *Pentandria*, five stamens.

A very numerous class, which contains six orders, monogynia, digynia, trigynia, tetragynia, pentagynia, and polygynia. Under this class may be enumerated the primrose and cowslip, the violet, the pimpernel, and many convolvule and bell-shaped flowers. Here we find the deadly nightshade, as well as the esculent potato, whose berries are poisonous; also the honeysuckle, the elm tree, the guelder rose, the elder, the ivy, the currant, and the gooseberry. To this class also belongs the very large tribe of umbelliferous plants, as the parsley, the hemlock, the carraway, the carrot, and the parsnip.

Class VI. *Hexandria*, six stamens.

It contains six orders (monogynia, digynia, trigynia, tetragynia, hexagynia, and polygynia), and comprehends the lily, the narcissus, the tulip, and several fine garden flowers of the bulbous tribe; the hyacinth, the daffodil, the snow-drop, the spider wort, the onion, and the asparagus. Several rushes are also found in this class.

Class VII. *Heptandria*, seven stamens.

A very small class, of which the magnificent horse-chestnut tree is the principal type.

Class VIII. *Octandria*, eight stamens.

With four orders—monogynia, digynia, trigynia, and tetragynia. The numerous family of the heath (*ericæ*) are here included; and also the sycamore, the evening primrose, the mezereon, the nasturtian, and the beautiful fuchsia.

Class IX. *Enneandria*, nine stamens.

This is a very small class, consisting of the order hexagynia. The principal wild flower is the flowering rush; and that remarkable exotic, the cinnamon tree, belongs to this class.

Class X. *Decandria*, ten stamens.

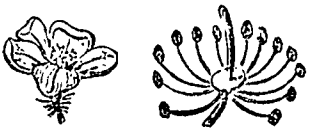
It has five orders—monogynia, digynia, trigynia, pentagynia, and decagynia. In this class are comprehended some very pretty wild-flower pinks, as the castle pink, the Cheddar pink, and the Deptford pink; also the very handsome tribe of saxifrages, chickweeds, the corncockle, the stonecrop, the arbutus, and the wood sorrel.

Class XI. *Dodecandria*, eleven to nineteen stamens.

This class contains six orders (monogynia, digynia, trigynia, tetragynia, pentagynia, and dodecagynia), and contains more exotics than native flowers. The sweet mignionette, or 'Frenchman's darling,' is a native of Egypt. In this class

we have the purple, or spiked loose strife, which grows on the edges of streams, and the houseleek.

Class XII. *Icosandria*, twenty or more stamens inserted in the calyx.

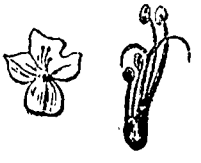


A very important class, the orders of which are monogynia, pentagynia, and polygynia. The rosaceous or rose-like plants, all bearing wholesome flowers or fruits, are found in this class, as the rose, the strawberry, the apple, the pear, the cherry, and the blackberry. Here we have also the myrtle, the cactus, the peach, the almond, and a vast number of fruits, both native and exotic.

Class XIII. *Polyandria*, from twenty to many hundred stamens, placed on the receptacle.

The plants of this class, though, like the last, possessing numerous stamens, are of a very different quality, many of them being actually poisonous; and, in analyzing the two classes, it is very necessary to observe the place where the stamens are inserted; because in all plants in which these organs grow out of the calyx, the fruit is wholesome; while in those where the stamens are placed on the receptacle of the flower, they are of a very suspicious character. The class polyandria is very numerous, and contains seven different orders, viz. monogynia, digynia, trigynia, tetragynia, pentagynia, hexagynia, and polygynia. To this class belong the opium-producing poppy (*papaver somniferum*) and the purple monkshood (*aconitum*). The water lily, the larkspur, the columbine, and many others also belong to it.

Class XIV. *Didynamia*, four stamens, two long and two short.

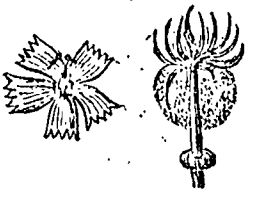


This class has only two orders, gymnospermia (naked seed) and angiospermia (a seed vessel). The two orders are easily distinguished by the peculiar characteristics which each name implies. Of the first order are the lavender, the thyme, the dead nettle, the horehound, &c. In the second order, which has its seeds in a capsule, we find the snapdragon, the foxglove, the monkey flower, and the pretty eyebright of the fields.

Class XV. *Tetradynamia,* six stamens, four long and two short.

It has two orders, Siliculosa and Siliquosa, and all its flowers are cross-shaped; whence the name of the natural order Cruciferæ, as applied to these plants. The first order is known by having a short pouch for the seed-vessel. The candytuft (*iberis*), the shepherd's purse, and the honesty (*lunaria*), belong to this order. The second order, Siliquosa, has a long pod for its fruit, and includes the wall-flower (*Cheiranthus*), the stock (*Matthiola*), the cardanum or cuckoo flower, and the numerous tribe of wild mustards. All the plants of the class Tetradynamia are considered as wholesome, and generally possess an antiscorbutic property. The cabbage, the radish, the sea-kale, and others, are in use as table vegetables.

Class XVI. *Monodelphia,* filaments or stalks united in tubes.



This class has seven orders, which are indicated by the number of stamens, viz.—triandria, pentandria, heptandria, octandria, decandria, dodecandria, and polyandria. In this class are the numerous tribes of geraniums and mallows, and also the hibiscus, the hollyhock, and others.

It should be here observed, that the orders of this class, and of the two following, are founded on the number of their stamens; and therefore we do not in this case count the stamens to ascertain the class (which is distinguished by other characteristics), but to determine the particular order of the class. The order of the 20th, the 21st, and the 22nd classes are also distinguished in the same way by their stamens.

Class XVII. *Diadelphia,* filaments united in two sets instead of one.

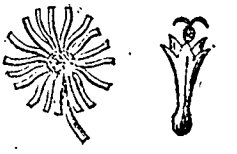
Flowers of this class are nearly all papilionaceous, or butterfly-shaped, and consist of four orders,—pentandria, hexandria, octandria, and decandria. This is a numerous and very useful

class, and contains plants which are not only ornamental but nutritious, either to man or cattle; as peas, beans, trefoils, tares, saintfoin, &c.; though a few of this class are deleterious. As ornaments of the field or the flower garden, we have the sweet pea, the coronella, the golden furze, the white and purple clovers, the blue and crimson vetches, the gay laburnum, &c.

Class XVIII. *Polyadelphia,* filaments united in three or more sets.

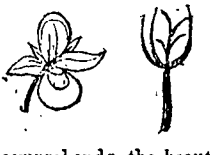
It is subdivided into four orders,—decandria, dodecandria, icosandria, and polyandria. The yellow St. John's wort (*hypericum*), which has been called 'The balm of the warrior's wound,' is its principal type. The South American plant (*theobroma*), which supplies us with the nuts of which chocolate and cocoa are made, is here included; but there are not many plants belonging to this class.

Class XIX. *Syngenesia,* anthers united so as to form a tube.



This may be considered as the largest of the Linnæan classes, and comprehends all the compound flowers (*Compositæ*), such as the dandelion, the thistle, the daisy, the groundsel, the sunflower, the dahlia, the marigold, the tansy, the hawkweed, and numerous others. It consists of five orders,—1. Polygamia æqualis, in which all the florets have both stamen and pistil, as in the dandelion:—2. Polygamia superfluæ, in which the florets of the ray have only one pistil, while those in the centre have both pistils and stamens, as in the tansy:—3. Polygamia frustanea, in which the florets of the centre have both stamens and pistils; but the florets of the ray are without any pistil; as in the corn blue-bottle:—4. Polygamia necessaria, in which the florets of the centre have only stamens, and those of the ray pistils alone, as the garden marigold:—5. Polygamia segregata, in which each floret has a little calyx of its own, independently of the common calyx; as in the globe thistle.

Class XX. *Gynandria,* stamens growing out of the pistil or germen.



This class comprehends the beautiful tribes of

the orchis and the ophrys; the latter of which bears so remarkable a resemblance to the humble bee, the fly, the butterfly, and other insects. It is subdivided into four orders—monandria, diandria, hexandria, and octandria.

Class XXI. *Monœcia*, stamens and pistils in separate flowers, but growing on the same plant.

This class is a highly important one, and includes a considerable number of forest trees, as the birch, the chestnut, the box, the hazel, &c. Among the number we find the celebrated bread-fruit tree (*artocarpus*), which supplies the natives of the South Sea Islands with their principal food, and whose fruit is as large as a loaf of bread. This class also comprehends the spurge (*euphorbia*), the sedges, the cucumber, and the gourd tribe. It is subdivided into seven orders—monandria, diandria, triandria, tetrandria, pentandria, polyandria, and monodelphia; and contains twenty-five different genera and 108 species.

Class XXII. *Diœcia*, stamens and pistils in separate flowers, but growing on different plants.

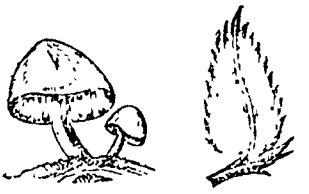
In this class we have (as in the preceding) a number of trees, as the poplar, the willow, and the yew; and also the graceful hop, and the mistletoe. It is subdivided into twelve orders, ranging from monandria to polydelphia; and this extreme division of its contents shows that it possesses very heterogeneous materials.

Class XXIII. *Polygamia*, stamens and pistils, separate in some flowers, united in others, either on the same plant or on two or three different ones.

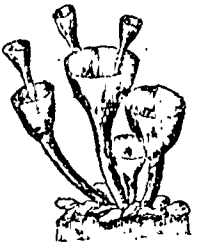
This class contains only two orders,—monœcia and diœcia. We have here only one native plant, the orache (*atriplex*), several species of which grow on salt marshes. In this class is comprehended the valuable plantain (*musa*), and also, in hot climates, the deadly nettle tree.

Class XXIV. *Cryptogamia*, stamens and pistils invisible.

In this class there are five orders, the peculiar characteristic of which is, that they do not possess sexual organs, or at least they are so concealed as not to have been yet discovered. The different orders are commonly known as



fungi, or mushrooms, ferns, mosses, lichens, and sea-weeds. The fungi comprehend not only the edible mushroom, but all those poisonous plants commonly called toad-stools. There are upwards of 300 species of British mushrooms. In tropical climates the ferns grow to the height of trees. There are about fifty British species, and many more in the tropics. Mosses mingle largely with other plants, in forming the vegetable substance called peat. Algæ and sea-weeds are found floating in large quantities, either on the sea or in fresh water. They all contain potash or soda, which is valuable in manufactures. The most common sea-weed is the sea-oak or bladder fucus (*fucus vesiculosus*), which has a number of bladders about it, and hangs in great profusion about the piers and bathing-places on the coast. Lichens may be often observed growing on old pales or gates, or on the roofs of houses, like lemon-coloured patches. The pretty plant which grows in groups on walls, in shape like a wine glass, is the *lichen oxydatus*, which is called the cup-moss, and assimilates to the *lichen rangiferus*, on which the rein-deer exists.



LICHEN OXYDATUS.

Independently of the classes and orders of Linnæus, it is necessary to take into consideration the genera, species, and varieties of plants,—that great botanist having made the flower and the fruit the basis of his generic distinctions.

The essence of every vegetable consists in the fructification of the flower and the fruit;—that of the flower in the antheræ and stigmata, and in the fruit in the seed. The flower is thus made up of seven distinct parts:—the *calyx*, or cup; the *corolla*, or flower petals; the *stamina*, or male organs of fructification; the *pistilla*, or female organs; the *pericarpium*, or matrix of the fruit; the *semina*, or seeds; and the *receptaculum*, or base, which receives the other parts of the fructification.

The term *genus* comprehends a number of plants which, in their leading characteristics, present similar features, while a species embraces those of

the same genus which are still more nearly allied by closer resemblances. Thus all violets (Linn. 5, order 1) belong to the genus Violet; and all roses (Linn. 12, order 3) belong to the genus Rose. There are, however, various kinds of violets, as the dog-violet, the sweet-violet-scented violet, and the Neapolitan violet, which all belong to the genus violet, but are different species of that genus. In like manner, there are several kinds of roses, as the damask-rose, the cabbage-rose, and the moss-rose, each of which is a different species of the same genus. But this was not the last step in classification; for it was ascertained that in some one point or other the genera resembled each other; and the class *Icosandria* (12), for instance, was devised, which should comprehend the rose, the cherry, the strawberry, the apple, and numerous others, which had the same characters in common. This would naturally give rise to the system of classes and orders. Thus we have the *rosa alba*, or white rose, of the class Icosandria and order polygamia; the species of the genus rose being expressed by the colour.

The term *variety* has also been introduced for the purpose of indicating some trifling change in the colour or size of a species, which perhaps may have been caused by removing the individual plant to another soil. It is not a certain feature of the plant, and we therefore term a flower so differing a variety of a species, and not another species. For instance, the white sweet-violet is not a distinct species from the purple sweet-violet, because, being exactly similar both in its structure and nature, it is but a white variety of the common sweet-violet.

The *Natural System of Plants*, as devised by Jussieu and De Candolle, differs materially from the Linnean system just detailed; for it takes into consideration the whole organization of the plant, with its properties and peculiar habits; and the most striking genus of a tribe of plants gives name to the order; as, for instance, the rose forms the type of the natural order Rosaceæ; and the violet that of the order Violaceæ, and so on. In this manner Jussieu divided the whole vegetable kingdom into fifteen classes, and the genera into one hundred orders, but which number has been gradually increasing with the general progress of discovery. By this method the cryptogamic plants are separated from the others; the seeds of these plants, which form the first class, being without cotyledons, or seed leaves, and all the others being distinguished into such as have seeds with one or two cotyledons. As the stamens are inserted below the pistil, on the calyx, or on the seed-vessel, the first description of seeds affords three distinct classes. The plants with two cotyledons next follow, and (from distinctions in the flower-leaves) are divided into those which are apetalous (without petals), monopetalous (single-petalled), and polypetalous (many-petalled). These again are subdivided, according to the insertion of the stamens and the union or separation of the antheræ which they support, into ten classes. These, with the four already mentioned, make fourteen. To these the declinous plants, so called from the separation of the stamens and pistils, are to be added, which completes the number, fifteen. These classes have no appropriate names, but are all distinguished by numbers, with a short definition of the essential character of each. The orders are chiefly named, as we have just stated, after some principal genus belonging to each. Thus the order Campanulaceæ derives its name from *campanula* (the Canterbury-bell), which is a diminutive of the Latin *campana* (a bell), the genus having been so called from the resemblance of its corolla to a bell.

The difference between the artificial system of Linnæus and the Natural Orders of Jussieu, with their relative advantages and disadvantages, may be thus summed up in the words of the author of the 'Vegetable Kingdom:'—'The natural system of botany is founded on the principle that all points of resemblance between the various parts, properties, and qualities of plants shall be taken into consideration; that thence an arrangement shall be deduced in which plants must be placed next each other which have the greatest degree of similarity in those respects; and that, consequently, the quality of an imperfectly-known plant may be judged of by that of another that is well known. It must be obvious that such a method possesses great superiority over artificial systems, like that of Linnæus, in which there is no combination of ideas, but which are mere collections of isolated facts, having no distinct relation to each other. The advantages of the natural system, in applying botany to useful purposes, are immense, especially to medical men, who depend so much upon the vegetable kingdom for their remedial agents. A knowledge of the properties of one plant enables the practitioner to judge scientifically of the qualities of other plants naturally allied to it; and therefore the physician, acquainted with the natural system of botany, may direct his inquiries when on foreign stations, not empirically but upon fixed principles, into the qualities of the medicinal plants which have been provided in every region for the alleviation of the maladies peculiar to it. He is thus enabled to read the hidden characters with which nature has labelled all the hosts of species that spring from her teeming bosom.'

Our own distinguished countryman, Professor Lindley, from whose valuable work the above remarks have been extracted, is also the author of a natural system of botany which is based upon the most accurate and extensive information, and which, in the botanical teaching of our schools, appears in some degree to be supplanting the recognised systems of Linnæus and Jussieu. Dr. Lindley reduces the whole of the vegetable creation to two great divisions—the 'Asexual, or Flowerless Plants,' and 'the Sexual, or Flowering Plants;' and these he subdivides into seven distinct classes, two of them under the asexual plants, and the other five under the sexual, of which the following is a condensed summary:—

Asexual, or Flowerless Plants.

Class I.—*Thallogens*, with stems and leaves undistinguishable; containing the Algales, the Fungales, and the Lichenales; 939 genera, and 8,394 species.

Class II.—*Acrogens*, with stems and leaves distinguishable; containing the Muscales, Lycopodales, and Filicales; 310 genera, and 4,086 species.

Sexual, or Flowering Plants.

Class III. — *Rhizogens*, with fructification springing from a thallus; 21 genera, and 53 species.

Class IV. — *Endogens*, with fructification springing from a stem; wood of stem youngest in the centre; cotyledon single; leaves parallel-veined, and permanent; wood of the stem always confused; — containing the Glumale, Arales, Palmales, Hydrales, Narcissales, Anomales, Orchidales, Xyridales, Juncales, Liliales, and Alismales: genera, 1,420; species, 13,684.

Class V.—*Dictyogens*, with leaves net-veined and deciduous; wood of the stem, when perennial, arranged in a circle, with a central pith: 17 genera, and 268 species.

Class VI.—*Gymnogens*, with the wood of the stem youngest at the circumference, and always concentric; cotyledons, two or more; seeds quite naked: 37 genera, and 210 species.

Class VII.—*Exogens*, seeds inclosed in seed-vessels; 6,191 genera, and 66,225 species.

This last class, being composed of innumerable faces, is divided into four sub-classes, which are again subdivided into various races and natural orders. The first sub-class contains the *Declinous* Exogens; the second, *Hypogynous* Exogens; the third *Perigynous* Exogens; and the fourth, *Epigynous* Exogens.

Such are the principal systems of botanical classification which have been presented to the world; and although there have appeared at different times about thirty systems, 'it is still probable,' says Dr. Smith, 'that the best one at the present moment is so imperfect that it must be amended yearly.'

Though great learning, research, and ingenuity have been displayed by the writers of these systems, there still remains one great defect pervading the whole,—and that is the want of vernacular simplicity in the nomenclature of botany. Not long ago the 'British Association for the Advancement of Science' issued an official report on the best means of 'improving the position of science in this country;' and it recommended, among other things, 'a complete reform in the treatment of the physical sciences.' To the promoters of educational progress this announcement must have been extremely gratifying; but the question arises—what is the most desirable kind of reform? To this we unhesitatingly reply, that of all the improvements which might be advantageously introduced, that of *simplifying the nomenclature of science*, and thus rendering it intelligible to the masses, would be of the greatest importance. The English language, which in the times of Chaucer and of Spencer was of too limited a character even to express the simplest ideas of philosophy or of science, is now becoming one of the most diffuse in the world, and the ever-recurring discoveries in science and art are daily contributing to its copiousness. In its composition it combines many of the graceful requisites of the Greek and Latin languages with the simple elements of its Teutonic original, and appears every way calculated not only to form our general colloquial language, but to express all the necessary terms of science without having recourse to the learned pedantry of past ages—the monandria and monogynia of Linnæus, or the thallogens and acrogens of Lindley. The science of botany, the various objects of which are constantly before our eyes, requires, above all, the utmost simplicity of nomenclature, to render it generally interesting and intelligible. In every rural walk the products of the vegetable world present themselves to the gaze of the multitude; and yet how few there are who comprehend the simplest elements of botany, or who can pretend to recollect the mystic nomenclature in which the science is clothed!

When the first portion of that valuable serial, 'Orr's Circle of the Sciences,' made its appearance, the subscribers were assured that the scientific treatises would be 'clothed in simple language, so as to render them easy introductions to practical studies.' But in this the public were sadly deceived; and the consequence was that the sale became so circumscribed as not to re-imburse the proprietors at the moderate price affixed, and an additional charge of 50 per cent. was made, by which the work was inevitably confined to the wealthier classes. To obviate, however, the objectionable features of a learned but unintelligible nomenclature, of which there were complaints innumerable, it was ultimately determined that a compendious glossarial index, explanatory of every scientific term, should accompany each treatise. For this rather difficult task the writer of the present article was selected, and he has reason to believe that those indexes have afforded material assistance to the non-classical student in the walks of science. But if these glossarial explanations or definitions were considered so absolutely necessary, why not adopt the simplified nomenclature which they naturally suggest, and more especially in their application to the popular science of botany?

Every admirer of nature feels desirous of becoming acquainted with the names of flowers, shrubs, and trees, which adorn the gardens and fields of our beauteous landscapes; but he wishes to call them by their simple names, and distinguish them by their tribes, kinds, species, and varieties; so that he may impress them on the memory, and be able to communicate them to others. He wishes to call a stalk a stalk, a root a root, and a thorn a thorn; and thus give preference to that Anglo-Saxon phraseology which, we all admit, constitutes the soul and beauty of our national poesy. But we are told by our scholastic *literati* that the ordinary vernacular language of common life is unscientific, and would render the subject too common-place—that to call a plant, or even the stalk of a plant, by its simple name, is excessively vulgar; and that we must, at least in learned society, call a flower-stalk *pedunculus*, and a foot-stalk *petiolus*—a thorn *crataegus*, and an oak *quercus*. We are also told that if we wish to pass for educated persons, we should,

in the language of science, designate the common water-cress the *nasturtium officinale*, the horse-radish the *cochlearia armoracia*, and the deadly night-shade the *atropa belladonna;* and so on. Even the simple forms of leaves are defined in a language so pedagoguish as to be entirely unintelligible to the multitude; the common trowel-shaped leaf being called *deltoides*, the heart-shaped *cordatum*, and the arrow-shaped *sagittatum!*

In the shrubbery of the royal gardens of Kensington, we shall find that the names of the various shrubs and trees are labelled in the learned language of the botanist, of which the thousands that perambulate those gardens are profoundly ignorant, especially the ladies, who are usually the greatest admirers of the floral kingdom; nay, even to men possessing high classical attainments, it is often the language of mystery. Thus the common birch-tree is there called the *betula alba;* the variegated sycamore the *acer pseudo-platanus;* the tulip tree the *lilio-dendron tulipifera;* and the common long-spined thorn the *cratægus macracantha.*

As we cannot expect even the well-educated multitude to be conversant with the learned and technical phraseology of a dead language, we have here a system of nomenclature which locks up the treasures of science, and clothes simple nature in the mystic language of the juggler and the charlatan. Surely those natural objects which are constantly before our eyes, as the flowers of the garden, or the trees of the forest, should be designated in the simple language of nature, and their classification reduced to such an intelligible form as to enable every individual interested in the subject readily to comprehend it.

The chief argument in favour of preserving 'the learned phraseology of science' is, that the language of the Romans, like their literature, has been universally adopted by the learned of all Europe; because in the barbarism of the middle ages there was no other language capable of expressing the variety of ideas which philosophy and science present to the inquiring mind; and that although our vernacular tongue, within the last century, has become sufficiently copious to express the most abstruse ideas, still the learned of the present day continue to feel a reverence for that language which enabled Pliny and Linnæus to name and classify the varied productions of nature, and clothe science in such appropriate terms as to render it intelligible to the learned of every nation.

There appears much plausibility in this mode of reasoning; but, after all, it has more of the dignity of learned assumption than of practical common sense. It is difficult to conceive why the terms of a dead language should be applied to the simple productions of nature, which can be clearly and forcibly expressed in our vernacular tongue. Thus, to adduce some familiar instances —surely the term 'Irish yew' is quite as appropriate as *taxus hibernica*, and certainly more simple and intelligible to the multitude;—the 'double-flowered furze' must be better understood than *ulex europæa var. flore pleno;*—the 'wall-flower' sounds as sweet as the Greek *cheiranthus;*—and the 'cuckoo flower of the woods' is a name more expressive than *cardamine pratense*, and quite as harmonious. Indeed such is the extensive range of science and art, in this enlightened age, that the short space of human existence is not sufficient to acquire a just knowledge of things, while the mind is devoted, for a long series of years, to the acquisition of a language which has ceased to form the ordinary medium of communication between man and man, or nation and nation. Hence it is, that useful and practical knowledge of the great works of nature is seldom attained by those who are scholastically, or what is termed classically, educated, and who have devoted the best portion of their youth to the study of the learned languages. Amidst the heterogeneous mass of words with which the mind is stored, the knowledge of things, so essential in this age of social progress, is too frequently neglected.

In fact, it requires a much longer study to obtain a critical and technical knowledge of these dead languages than it would to become practically acquainted with the general elements of the leading sciences, if our own vernacular tongue were generally called into use.

As to the classes and orders of Linnæus, *Monandria, Monogynia*, &c., which were adopted from the Greek in an age when the languages of modern Europe were in a semi-barbarous state, there is no question that a simple system of consecutive numbers (presuming we are disposed to retain the classification of Linnæus), would be decidedly preferable, and much more intelligible than a string of long Greek words possessing very little relation to the subject; as Class 1, 2, 3, 4, &c.; Order 1, 2, 3, and so on. Thus in speaking of the simple wall-flower, the specification of Class 15, Order 2, would be much easier to explain and recollect than Class *Tetradynamia*, Order *Digynia*. And, moreover, in the representation of numbers, we have the advantage of a language, (the Arabic system of notation), which is common to all the civilised world.

How difficult it must be to impress upon the memory of a lady, or of a juvenile student, such a host of puzzling terms as *dodecandria, enneagynia, enneandria, dodecagynia*, &c.! How much valuable time must be wasted in the attempt! And where is the utility, when the same would be better understood as Class 11, Order 9, and Class 9, Order 12? Surely the class and order of the lily, which our would-be learned botanists inform us belongs to Class *Hexandria* and order *Monogynia*, would be more simply defined as Class 6 and Order 1, by which we should clearly understand that the flower contains 6 stamens and 1 pistil. Again (to revert to the Natural System of Jussieu), would not the terms *Liliaceæ, Roseaceæ*, &c., be better expressed and understood by the simple appellation of the *Lily* tribe, the *Rose* tribe, and so on? Then why should we continue to be the slaves of a system, or fashion, which is only calculated to retard instead of promoting the progress of scientific and physical knowledge, or confine it to a very few

even of those who are denominated 'the learned?' Our own language, by its enrichment from various others, and its peculiar facilities in the compounding of words, has become sufficiently diffuse to express nearly all the general terms of science, without having recourse uniformly to a dead language.

If we had an ANGLO-NATIONAL ACADEMY, consisting of well-educated practical men, whose object was to diffuse a knowledge of things useful to society, instead of an affected love of words 'of learned length and thundering sound,' the whole of the vegetable kingdom could be classified and reduced to the simple rules of nature, expressed in our vernacular tongue, according to the properties, appearances, or locality, of every flower, shrub, or plant to be described. All the vegetable creation, from the lofty palm to the humble heath, could be classified in tribes, kinds, species, and varieties—words which are perfectly intelligible and familiar to all. Thus the *Rose* tribe would be divided into various *kinds*, as the *moss* rose, the *damask* rose, the *cabbage* rose, the *white* rose, &c. The various kinds of the *Violet* tribe would be distinguished as the *sweet-scented* violet, the *dog* violet, the *Neapolitan*, &c. Where a diversity of colour or other peculiarity existed, it would give a name to the *species* of the kind. Thus the whole family or race of lilies would be named the *Lily* tribe; of the pinks, the *Pink* tribe; of the daisies, the *Daisy* tribe, and so on; —their kinds, species, or varieties being expressed in plain English, agreeably to the characteristic features of each. In the same manner might the loftier productions of vegetable nature—the oaks, the elms, the pines, the poplars, the chestnuts, the fruit-trees,—be systematically and intelligibly classified, according to their respective tribes, kinds, and species, in the simple language of our mother tongue.

BOTTLE CONJUROR. On the 16th of January, 1748, an impostor managed to attract an immense crowd to the old theatre in the Haymarket, by announcing that he would jump into a quart bottle. Numbers were induced to attend, and hundreds were turned away, from not being able to obtain admission. It is scarcely necessary to state that the impostor did not perform the promised feat, which so excited the audience that a riot ensued, and some damage was done to the place of public entertainment.

BOUCHE OF COURT, a very common term in the middle age, for describing the allowance of provision from the king to the knights and servants who attended him in any military expedition. It was something like our modern rations, and consisted of bread, beer, and wine. This custom was also in use in the houses of noblemen, when attended by their squires and servitors.

BOULDERS (iii. 632), fragments of rocks, lying on the surface of the ground, or embedded in what are usually termed by geologists the diluvial deposits, consisting of clays, sands, &c. They appear to have been transported from some distance, and are generally worn and rolled by mechanical attrition. They differ from the rocks they overlie, and bear evident marks of abrasion and transport, in the angles being worn off, the surface smoothed, and very much scratched, or grooved longitudinally. This rolling of blocks of stone from high mountains to a considerable distance, necessarily produces considerable effect, and sometimes their edges are very much rounded. Sometimes, instead of being worn round, the boulder rock will appear jagged and broken; these appearances being effected by local and peculiar circumstances. These different blocks accumulating at the foot of a mountain, form a sort of connecting link, which unites the plain with the mountains. The action of the diluvial current thus appears not to have been confined to the transport of small fragments, which constitute beds of gravel; but large masses of rolled stones, or boulders, have been torn away from their primitive rocks, and carried to a distance by the force of the overwhelming waters. The grey-wethers in Salisbury Common, and the Logan rock in Cornwall, are examples of this peculiar structure; and of the effect of rocks transported from a distance; and which thus strongly contrasts with the general structure and geological features of the neighbouring country. In Cumberland there is a spheroidal mass of granite, near Hoyton Castle, more than four feet high, and above ten feet in diameter. This is a granite boulder, supposed to have been transported from the Criftel Mountain in Dumfriesshire. At High Peak in Derbyshire, there is another boulder rock, which is ten feet high, nine wide, and twenty-one in length. Throughout the whole of Staffordshire, Shropshire, and Cheshire, these boulders are everywhere distributed, many of which are supposed to have been caused by the force of diluvial action from the Welsh mountains.

There is sufficient geological evidence from these transported masses, to show that a great body of water, at some period of the earth's history, has passed over Great Britain from north to south. If, however, this supposition is founded on probability, the evidence of such passages or passage (says De la Bêche) 'should be found in the neighbouring continents of Europe; and the general direction of the transported masses should be the same. Now this is precisely what we do find. In Sweden and Russia large blocks of rock occur in great numbers, and no doubt can be entertained that they have been transported southward from the north. In addition to this, it appears that as early as the year 1740, Ehrhart had traced to the Tyrol the granite blocks found in the country situated between the Danube and the Alps; and Von Buch ascribed those found in the north of Germany to the northern regions of Norway.'

BOURMONT, LOUIS AUGUSTE VICTOR, Marshal of France, and the first Governor of Algeria, under Charles X. Few individuals have experienced so many vicissitudes of fortune as this remarkable man. From the time he entered the French guards, in 1788, to February 1809, he was perpetually engaged in the tourbillon of revolutionary changes. He was constantly shifting from soldier to *emigré*, from a state of

liberty to incarceration, or from the royal to the imperial cause. Amidst all the freaks of fortune, however, he managed to attain the rank of brigadier-general; and in 1814 he was employed in the first division of the Paris reserve. In that year's campaign he was severely wounded. On the restoration of the Bourbons he was, as general of division, continually employed on peace duties; but in 1823 he was sent to Spain with the army of occupation, which was engaged in putting down the Cortes, and liberating King Ferdinand from their power. On his return to France, in 1824, he resumed the command of the second infantry division of the royal guard. In 1820 the Dey of Algiers having insulted the French consul, Bourmont was sent to Africa as commander-in-chief of the French expedition against that stronghold of Algerine piracy, and in that memorable enterprise he was completely successful. He attacked the city both by sea and land, and at length compelled the Dey to capitulate; on which the French took possession of the town, the fleet, and the treasury, where they found two millions sterling in stores and precious metals. The Dey abdicated, and fled to Europe. Charles X. was so gratified with this conquest that he immediately raised Bourmont to the dignity of a Marshal of France. In the capitulation by which the French became possessed of the city of Algiers and the forts and harbours depending on it, no mention was made of the provinces or of the native tribes, over which the Dey had little authority. It was true that the Moors of Algiers, Oran, and Bona became subjects of France; but the Arabs and Kabyles of the provinces offered a strenuous resistance. Hence was Marshal Bourmont, and afterwards Marshal Clauset, engaged in many desperate combats with the Arabs and Kabyles at Bleda, near the Little Atlas, and at Medeyah, the capital of the province of Tetteri. Soon after the conquest of Algiers, however, the government of Charles X. was overthrown, and Bourmont, refusing to take the oath imposed by the French government under Louis Philippe, was dismissed; and with this event was terminated the military and political career of his chequered life.

BOVISTA GIGANTEUM. This gigantic fungus (iii. 694) has been known to acquire the size of a gourd in one night; and from the rapid development of its cellular tissue, Professor Lindley has made some curious calculations. Supposing that the cellules of this plant are not less than the 1-200th part of an inch in diameter, a plant of the above size will contain no less than 47,000,000,000 cellules; so that, supposing it to have grown in the course of twelve hours, its cellules must have been developed at the rate of nearly 4,000,000,000 per hour, or of more than 66,000,000 in a minute. When we consider that every one of these cells is composed of innumerable molecules, each one of which is again composed of several elementary molecules, we feel astonished at the number and minuteness of the parts employed in this stupendous production of the vegetable world. (Dr. Lindley's *Introd. to Botany.*)

BOWIE-KNIFE, a large clasp knife carried by hunters and many citizens in America.

BOWLES, REV. WM. LISLE, poet and miscellaneous writer. He was born at King's Sutton, in Northamptonshire, of which parish his father was vicar, in 1762. He was educated at Winchester and at Trinity College, Oxford, where he took his degree in 1792. On leaving the university he was admitted to holy orders, and appointed to a curacy in Wiltshire. He was soon afterwards preferred to a living in Gloucestershire, and in 1803 to a canonry in Salisbury Cathedral. His next advance in clerical preferment was to the rectory of Bremhill, in Wiltshire, to which he was presented by Archbishop Moore. Such were the steps by which he advanced to the dignities and emoluments of the church. But our chief business is to draw attention to his talents as a poet and general writer. His first appearance as a poet was a small collection of sonnets, which were published in 1789, and which gave promise of a new era in lyrical poetry. In these sonnets there was a species of musical versification and graceful expression, which gave a charm to those sentiments of melancholy tenderness, which are so congenial to the poetical temperament. Other diversified poems, which he afterwards gave to the world, did not fail to realise the promises of his youthful *début*. Among these the most prominent were, 'Hope, an Allegorical Sketch,' 'St. Michael's Mount,' 'Coombe Ellen,' and the 'Grave of Howard.' In 1804 he published the longest and the most laboured of his productions, entitled 'The Spirit of Discovery by Sea.' Several works of a miscellaneous character, literary, antiquarian, topographical, biographical, and theological, were the productions of his prolific pen. His 'History of the Parish of Bremhill,' of which Mr. Bowles was rector, affords evidence of the indefatigable spirit with which a poet could enter into the perplexing mazes of topographical and genealogical inquiries. As a topographer and an antiquary he contributed for many years to the pages of the *Gentleman's Magazine*. But the work which gained him the most celebrity was his edition of Pope, not so much for any peculiar talent therein displayed, as for the famous literary controversy with Lord Byron to which that publication gave rise; the great question between the two disputants being—whether the genius of poetry derives more inspiration from nature or art. He died in 1850.

BOYADJI KEUY, CONVENTION OF. A treaty between Austria and the Porte, signed at Boyadji-Keuy, on the 14th of June, 1854. It consisted of seven articles, and provided for the occupation of the Danubian Principalities by the Austrian forces. The Austrians entered Bucharest on the 6th of September, 1854; and by the Treaty of Paris they engaged to retire immediately.

BRACHMANS, a very ancient sect of philosophers, or theologians, in India, which still exist in Hindoostan under the name of Brahmins, and retain many of the traditions and tenets of their ancient prototypes. With the Brachmans of India Alexander the Great had some singular conferences; and Arrian, the Greek historian, has

given some curious particulars of their opinions and general manners. 'They do not pay any tribute to the prince,' says he, 'but assist him with their counsel, and perform the same duties as the Magi do to the kings of Persia. They assist at the public sacrifices; and if a person desires to sacrifice in private, one of these must be present; otherwise the Indians are persuaded the sacrifice would not be agreeable to the gods. They apply themselves particularly to consulting the stars. None but themselves exercise the art of divination; and they foretell chiefly the change of weather and of the seasons. If a Brachman has failed thrice in his predictions he is silenced for ever.' Their sentiments, according to Strabo, were not very different from those of the Greeks. They believed that the world had a beginning; that it would end; that its form was circular; that it was created by God, who presides over and fills it with his majesty; and that water was the principle of all things. With regard to the immortality of the soul and the punishment of the wicked in hell, they followed the doctrine of Plato, intermixing with it, like that philosopher, some fictions, in order to express or describe those punishments. Several among them always went naked, whence the Greeks gave them the name of Gymnosophists. As they admitted the Metempsychosis, and believed that the souls of men transmigrated from their bodies into those of beasts, they abstained from the flesh of animals. It is thought that Pythagoras borrowed this doctrine from the Brachmans of the East.

BRACHYU'RA (Gr. *βραχὺς* short, and *οὐρὰ* a tail), a tribe of Crustaceans, of the family of Decapoda or crabs, in which the tail is shorter than the trunk, and without appendages or fins at the extremity. When in a state of rest the tail is doubled under, and received in a fossula on the chest. The antennæ are small, and the peduncles of the eyes larger than in the Macrura. The branchiæ are arranged in a single row in the form of pyramidal plates.

BREAKWATERS are massy structures thrown up at the mouths of harbours, rivers, or estuaries, and intended to protect the shipping or buildings from the violence of the ocean or the tidal sea, or to prevent the neighbouring lands being overflowed. They are usually constructed of huge masses of stone, and sometimes of strong pieces of timber, rubble, and earthwork. They have been found of great advantage, and at present exist in almost every portion of Europe, where the coast is exposed to the raging waves of the main. In magnitude and extent they differ more or less according to circumstances; but probably the largest and most effective in Great Britain is that which has been erected across the Plymouth Sound for the protection of the shipping and harbour from the devastations of the Atlantic Ocean. A short description of it will afford some idea of the vast amount of labour and expense which the formation of these breakwaters entail.

Plymouth Breakwater may be said to be one of the greatest wonders of industrial art which the present century has been able to accomplish. The work consists of an insulated mole or vast heap of stones and stonework, stretching across the Plymouth Sound, and opposing a barrier to the heavy rolling swell of the Atlantic. It was begun on the 12th of August, 1812, and took nearly forty years to accomplish. The cost of its formation was upwards of one million and a half sterling. The straight portion of this vast mass of stonework is about 1000 yards in length, and the two wings 356 yards each, making up the total length to about a mile. The width of the line of stonework at the bed of the sea varies from 300 to 400 feet; whereas it slopes so rapidly upwards that the breadth at high-water mark is only fifty feet. The top is a flat horizontal surface, elevated a small distance above the surface of the water. The total depth varies from 40 to 80 feet. The mode of forming it was singular. Mr. Rennie designed the plan, and carried it out in defiance of all opposition and difficulties. This plan consisted in hurling into the sea masses of stone weighing from one ton to ten tons each, sufficiently heavy to resist the force of waves, tides, and currents. A promontory of compact close-grained marble, belonging to the Duke of Bedford, was purchased as a storehouse of materials for the sum of 10,000*l*. Quarries were opened at this spot, and for many years the business of quarrying was carried on.

The huge blocks of marble extricated from the quarries were conveyed in trucks along iron railways to quays, where they were received in vessels built expressly for this purpose. On arriving over the line of the breakwater a sort of trap-door was opened in the vessel, and the load of stone fell into the sea, where it lay upon and among the stones previously thrown. All the lower stones were left to settle as they might; but the upper layers consist of smooth masonry, better calculated to resist the action of waves.

At the western end is a lighthouse, an elegant structure of granite, recently completed; it is about fifty-five feet high, by fourteen in diameter at the base; at the top is a large lantern, through which is exhibited a white light towards the north, and a red light towards the south.

Firmly has the breakwater done its work. In 1817 and 1824 it was visited by storms which, had not the breakwater been there, would have brought awful destruction on the vessels within the harbour. As it was, some of the surface stones were loosened and washed away; but the main structure remained wholly uninjured.

BRECNOCKSHIRE, in Wales (iii. 766). According to the general census of 1851, the population of this county was 61,474; and that of the principal places was as follows:—

Brecon	6,070	Crickhowel ..	1,103
Builth	1,158	Hay	1,952

BREEZES, SEA AND LAND. The phenomena of the general currents which pervade our atmosphere depend principally on the two following circumstances:—viz. the unequal temperature of the equator and the poles, and the diurnal motion of the earth on its axis. These causes (with their attendant incidents) are continually operating in different forms and degrees,

so as to produce all that infinite variety among the winds which we observe in nature. But the changes are so numerous and diversified as to baffle all philosophical inquiry. An explanation, however, of what are termed sea and land breezes is more easy, and is applicable to many similar phenomena. During the day, the surface of the land receiving the sun's heat, communicates its temperature to the circumambient atmosphere. The air expanding in bulk, from the great accession of caloric, becomes more rarefied, and specifically lighter, and in consequence rises, while the cooler air from the surrounding sea rushes in to supply its place, and thus produces the current called the sea breeze. On the contrary, the waters of the sea throw off their heat much more slowly than the land, whence a reverse action takes place, which creates what is known as the land breeze. In the warmer latitudes these principles are in fuller operation than in colder climates, and the sea and land breezes are much more common, and produce the most agreeable alternations of temperature.

BREMER, REAR-ADMIRAL SIR GORDON, was born in 1786, and entered the navy, as a first-class volunteer, in 1794. After having passed through the subordinate degrees of the service with great credit, he was, in 1807, appointed to the command of the Rattlesnake, of 18 guns; and in 1813 he assumed the command of the Royalist, 18. While in that vessel he captured four American schooners, and aided in the taking of two others. On the following October he co-operated with the Scylla, 18, at the capture of the French frigate Le Meser, of 40 guns and 340 men. In 1815 he was nominated C.B., and in 1816 was appointed to the Comus, 28, in which he was wrecked on a reef of rocks off Newfoundland. In February, 1824, he was sent to establish a colony in Melville Island, Australia, whence he afterwards proceeded to India, and there joined in the closing scenes of the Burmese war. In 1837 he was appointed to the Alligator, 28 guns, and again visiting Australia he founded the settlement of Port Essington, as it now exists. He once more visited India, when, on the death of Sir F. L. Maitland, in 1839, he became Commander-in-Chief. In 1841 he left Singapore on a mission of triumph and glory to China, and contributed most effectually to the operations of the war, until the capture of Chusan. For his valour in the conflict, and his discretion as a plenipotentiary in council, her Majesty conferred upon him the dignity of K.C.B., and he also received the thanks of Parliament. In 1846 he was appointed to the command of the Channel Squadron, with his flag on board the Queen, 110 guns; and during the same year he became commodore-superintendant of Woolwich Dockyard; from which office he retired in 1848, and attained the rank of rear-admiral in 1849. He died in 1850.

BREVIPEN'NES (Lat. *brevis* short, and *penna* a quill), in ornithology, the name of the first family of the order Grallæ, according to the classification of Cuvier. The wings are extremely short, and not adapted for flight. The ostrich is the type of this family.

BREWING (vol. iii. 781). Tacitus informs us, that the art of brewing and the use of beer were known in very remote ages among the Northern nations, and that this liquor was the favourite drink of the Anglo-Saxons and Danes, as it had been of their ancestors the Germans. Before their conversion to Christianity, they believed that drinking large and frequent draughts of fermented malt liquors was one of the chief felicities which those heroes enjoyed who were admitted into the halls of Odin. After the introduction of agriculture into this country, malt liquors were substituted for mead, and became the most general drink of all the ancient Britons. Both ale and beer are mentioned in the laws of Ina, King of Wessex.

Among the different kinds of drinks provided for a royal banquet, in the reign of Edward the Confessor, ale is particularly specified. In Scotland and Wales they had at this time two kinds of ale, called common ale, and aromatic ale, both of which were considered as articles of great luxury among the Welsh. Wine it appears was then unknown even to the King of Wales. Buchan, in his 'History of Scotland,' mentions the use of malt liquor at a very early period, and calls it "*Vinum ex frugibus corruptis.*" All the ancient malt liquors, however, seem to have been made entirely of barley, or some other farinaceous grain, and therefore were not generally calculated for long keeping, as this quality depends considerably, though not entirely, on the bitter principle of the hops with which the liquor is impregnated. The use of this plant, in the art of brewing, is comparatively of recent introduction.

(Nuttall's *Archæol. Dict.*)

BRIG'ANDINE, a kind of armour used in the Middle ages, and frequently mentioned by writers of that period. It consisted of many plates and joints like a coat of mail. The foot soldiers, who were clothed with this armour, were called *Brigands*. The word is particularly mentioned in the 4th and 5th of Philip and Mary, cap. 2. Some confound the word with *Brigantine*, a long, but low-built vessel, adapted for swift sailing.

BRITTON, JOHN, the well-known topographer and antiquary, was born in 1771, at the village of Kington, in Wiltshire. His parents were in very humble circumstances; his father being a little shopkeeper and farmer. In this secluded spot John Britton passed the first sixteen years of his life with very few opportunities of scholastic learning. He first went to the school of the village dame, where he learnt the alphabet and the nine figures of arithmetic from a hornbook. At six years of age he was sent to the school of Yatton-Keynell, or Church Eaton, where the celebrated antiquary, John Aubrey, received the rudiments of his education two centuries before. The remainder of his education was obtained under Mr. Sparrow at Chippenham; but when he quitted his school, at the age of thirteen, he had acquired very little useful learning. In 1785, an event happened,

which young Britton thought a fortunate epoch in his life. At the sale of Squire White's household property, a lot of books, nine in number, was knocked down to him for one shilling! Among these were the 'Life of Peter, Czar of Russia,' 'Pilgrim's Progress,' and 'Robinson Crusoe,' which afforded him the greatest delight and instruction. At the age of sixteen he set out for London, where, at the recommendation of his uncle, he was apprenticed to a wine-merchant in Clerkenwell. But after a dreary and monotonous servitude of four years and a half, his indentures were cancelled. He contrived, however, to cultivate his taste for reading, and out of his little savings was enabled to purchase the novels of Smollett, Fielding, and Sterne; besides other works of a scientific character; as Derham's 'Astro-Theology and Physico-Theology,' Cheselden's 'Anatomy,' Ray's 'Wisdom of God in Creation,' &c. At this time he had formed an acquaintance with Mr. Brayley; with whom he was afterwards associated in many of his literary undertakings. Jointly with him he brought out a satirical ballad, called 'The Guinea-Pig,' which was a clever satire on the Powder-tax. His necessities now compelled him to seek employment. He was successively engaged as a cellarman at the London Tavern, next at a spirit store in Smithfield, and then as an Attorney's clerk in Gray's Inn, at 15*s.* per. week. At this time he frequented the Free-and-Easies, and the Spouting Clubs, which abounded in every part of the town; and at the Old Change in Cheapside, and Jacob's Well, he became one of the leading stars in reciting tales and poems by Peter Pindar, George Colman, O'Keefe, and other comic writers. He also became a member of a theatrical club, which performed at a place called the Shakspearian theatre in Tottenham-Court-Road. Fortune now began to smile upon him, and confer some little reward on his varied efforts. In 1799 he received an engagement of three guineas a week, to write, recite, and sing at a theatre in Panton Street, Haymarket. On the destruction of the theatre by fire, in 1800, he was engaged by Mark Lonsdale at the Lyceum theatre, to draw up and recite descriptions of panoramic views of Egypt. He now became acquainted with all the leading dramatists and actors of the day, whose qualities he has fully recorded in his 'Autobiography.' In 1799 he brought out the 'Life and Adventures of Pizarro,' which was suggested by the extraordinary success of Sheridan's play, as adapted from Kotzebue. This met with tolerable success. In 1801 he made his *début* in that department of literature with which his name is so honourably associated, by the publication of two volumes of the 'Beauties of Wiltshire;' the third volume not being brought out before an interval of twenty-four years. In 1814 he published a comprehensive history of his native county in the fifteenth volume of the 'Beauties of England and Wales.' It would be impossible here to notice the numerous works of a topographical or antiquarian character which issued from his pen during the last 40 years of his life; but the most important were his 'Architectural Antiquities of Great Britain,' and the 'Cathedral Antiquities of England.' His last work was his 'Autobiography,' which contains many curious reminiscences of the various public characters with whom he had come in contact during his long and eventful literary career. He died in January 1857, and was interred in the Norwood cemetery.

BROCKEN. [MIRAGE, *Supplt.*]

BROMBENZOIC Acid, an acid prepared from dry benzoate of silver and bromine, which forms a colourless crystalline mass. It consists of twenty-eight atoms of carbon, nine of hydrogen, and eight of bromic acid. (Craig.)

BRONZITE, a mineral of a yellowish-brown colour, with a semi-metallic lustre. It consists of silica, 60; magnesia, 27·5; oxide of iron, 10·5; water, 0·5. It has been found in a syenite rock in Glen-tilt, Perthshire.

BROOME, WILLIAM, was born in Cheshire, of very humble parents. He was educated at Eton, and became captain of the school. He went to St. John's College, Cambridge, and in early life obtained, from his addiction to metre, the surname of *the poet*. In conjunction with Ozell and Oldisworth, he translated the 'Iliad' into prose. Pope sought his assistance in the translation of the 'Odyssey.' Pope undertook half of the work, dividing the remaining half between Fenton and Broome. Eight books, the 2nd, 6th, 8th, 11th, 12th, 16th, 18th, and 23rd, fell to Broome's share, together with the toil of writing all the notes. For this he received five hundred pounds, with as many copies of the work as he wanted for friends, which amounted to £100 more. Broome was made rector of Sturston, in Suffolk, where he married a wealthy widow. He received other preferment from the crown, and died at Bath, November 16, 1745. (Johnson's *Lives of the Poets;* Chalmer's *Biog. Dict.*)

BRUAT, ADMIRAL, commander of the French fleet in the Black Sea. He was born at Colmar, in Alsace, in 1796; and entered the naval school at Brest in 1811. After passing through the various grades of the service, and having been engaged in the expeditions of Navarino, Algiers, Otaheite, Toulon, Martinique, &c., he was promoted to be rear-admiral in 1846, and vice-admiral in 1852. In 1853 he took charge of the French channel squadron; and in 1854 he became second in command of the Black Sea, in the late contest with Russia. He took an effective part in the bombardment of Sebastopol on the 17th of October; and was in active co-operation with the British fleet during its operations in the Black Sea. When Admiral Hamelin returned home, Bruat took command of the squadron, and received his appointment of full admiral. He shortly afterwards took leave of the Black Sea; and having repaired to Constantinople, he was received by the sultan with the highest honours. He was on his voyage to Toulon, when he was suddenly attacked by a disease which terminated fatally, on the 25th of November, 1855. His obsequies were celebrated with great pomp at the church of the Invalides; and his remains were interred in the cemetery of Père la Chaise.

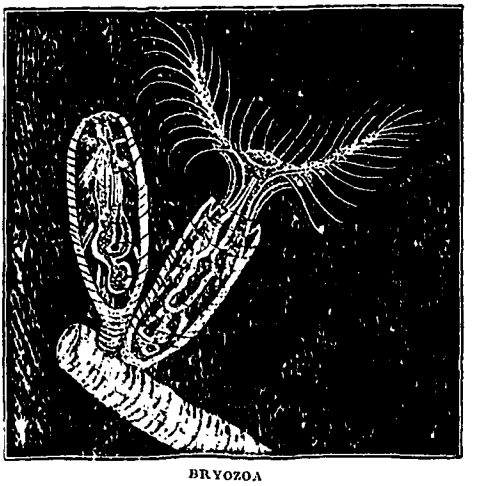
BRUMMEL, BEAU. From 1734 to 1764, one William Brummel was the faithful and confidential servant of Charles Monson, brother of the first Lord Monson, and this person is supposed by a correspondent of 'Notes and Queries' to have been the father of 'Beau Brummel.'

George Bryan Brummel was born on the 7th of June, 1778. He went to Eton, and thence to Oxford, and on the 17th of June, 1794, was gazetted to a cornetcy in the 10th Hussars, at that time commanded by the Prince of Wales, afterwards George IV., with whom he contracted an intimacy. He became a leader of the fashion. An estrangement afterwards occurred between him and the Prince of Wales. He fell into difficulties, retired to the Continent, and was made consul at Caen. This appointment he lost, and in 1835 was arrested by his creditors. On his release his mind became affected, and he died in a lunatic asylum at Caen, on the 29th of March, 1840.

BRUNEL, Sir ISAMBERT, an engineer, whose name has become celebrated in the annals of art, from his wonderful skill in executing the Thames Tunnel, which, under great difficulties, he conducted from the Middlesex to the Surrey side of the river. He was a Frenchman by birth, and born at Hacqueville in Normandy in 1769. Though originally intended for the church, his predilection for the physical and mathematical sciences became so strong, that his original destination was relinquished, and he entered the Royal Navy, made several voyages to the West Indies, and returned home in 1792. At this time the French Revolution was in its zenith, and he quitted France for the United States, when necessity fortunately obliged him to pursue the natural direction of his mind, and to adopt the profession of a civil engineer. Here he was engaged in many important works; but having determined on visiting England he offered his services to the British government, and was eventually employed in Plymouth Dockyard, to carry into operation his newly-invented plans for making shipblocks by machinery. His scheme at first met with the strongest opposition; but its many advantages have since rendered its adoption universal. At the time of its introduction he selected Mr. Henry Maudslay, an engineer of Lambeth, to assist in the execution of the work; and thus was laid the foundation of one of the most extensive engineering establishments in the kingdom. On the conclusion of the war, Brunel received a visit from Alexander of Russia, when he submitted to the emperor a plan for making a tunnel under the river Neva, on which St. Petersburgh is built, the erection of a bridge being attended with great difficulties, owing to the vast accumulations of ice, and the suddenness with which it breaks up on the termination of winter. This scheme was not carried into effect; but it originated his great plan for the formation of a tunnel under the Thames, which, after many difficulties, was completed and opened in 1843. For his great engineering talents Mr. Brunel received the honour of knighthood. He died in 1849.

BRUTIA'RII, inferior officers attached to the Roman magistrates, whose duties were little superior to those of beadles or messengers. They received their name from the *Brutii*, a people of Italy, so called because they had ignominiously submitted to Hannibal, for which they had been deprived of their liberty by the Romans.

BRYOZO'A (Gr. *βρύον* moss, and *ζῶον* an animal), in zoology a very curious class of polypous molluscoids. The primary division of the Cuvierian Polyfera is now generally admitted to be into the Bryozoa and the Anthozoa; the former being the true mollusca, and properly forming part of the class Tunicata; while the latter are true radiated animals. The Bryozoa are divided into two orders, the Infundibulata, which are all marine, and the Hippocrepia, which inhabit fresh water. The former are characterised by having the tentacles placed in a circle round the mouth; while those organs in the latter are situated upon two arms diverging from the sides of the body. Each of the Bryozoa resides in a distinct cell, in which it can retract itself at will. The cells are generally free; but sometimes they form a calcareous mass, similar to the corals. The peculiarity of these molluscoids is, that they have ciliated tentaculæ placed at the anterior part of the body, by the action of which a kind of vortex is formed in the water: and thus the minute animals that constitute the food of the creature are carried down into the mouth, which is placed between the tentacles. The mouth leads into a muscular œsophagus, below which the stomach is situated, at the lowermost portion of the body. From the upper part of the stomach, the intestine springs, and leads to an anal orifice. The annexed is a representation of two Bryozoa, on a magnified scale; the one retracted within its cell, the other expanded, and seen from behind.



BRYOZOA

The Bryozoa are diffused through all latitudes, and according to recent geological discoveries they appear to have existed at a very early period of the earth's history; for many of the corals of the palæzoic series belong to this division of natural history. The vast stony structures which they raise would seem to have been formerly more

abundant in our own seas than at present; entire reefs having been produced by their growth, as they are in the tropical seas by the growth of the existing corals of the lamelliform kind. The physical changes which the Bryozoa undergo are extremely curious, and the development of the embryo presents some remarkable phenomena. The impregnated eggs, in the first place, escape into the water through a minute aperture placed close to the anus. A ciliated embryo is produced in each egg, and in the interior of this, while still enclosed in the egg, two little bryozoa, furnished with tentacula, make their appearance. The embryo soon effects its escape, swims about for some time, and then attaches itself, when the little creatures enclosed therein break out, and lay the foundation of another extensive group.

(Cuvier's *Animal Kingdom;* Dr. Johnston's *British Zoophytes.*)

BUCCINOI'DEA (Lat. *buccina* a trumpet, and Gr. εἶδος like), a name given by Cuvier to a family of the Pectinobranchiate Gasteropods. They include those species which, like their type Buccinium, have a spiral shell, in the aperture of which, near the extremity of the columella, is a notch or a canal for transmitting the syphon of the animal. (Cuvier.)

BUCEPH'ALUS (Gr. βοῦς a bull, and κεφαλὴ a head), the name of a celebrated and fiery-spirited war-horse, which belonged to Alexander the Great, and which none but his master could mount. It was so called from its head resembling that of a bull.

BU'CEROS (Gr. βοῦς an ox, and κέρας a horn), the genus of a family of large birds of India and Africa, which are remarkable for their enormous bills, and commonly called Hornbills. They are usually furnished with protuberances of different shapes at the base of the upper mandible. They subsist on all kinds of food. Their flight is sailing, and resembles that of a crow. The larger species are extremely shy and difficult of approach, and they always perch on the decayed branches of lofty trees, where their vision can command a wide range.

BUCHAREST (iii. 892), TREATY OF. At the time when the elder Napoleon was about to attack Russia, in the famous campaign of 1812, the Czar Alexander thought it expedient to enter into a treaty of peace with Turkey, upon which power he had made war. This was effected by the Treaty of Bucharest, signed on the 28th of May, 1812, in which it was stipulated that the river Pruth should henceforward form the boundary of the two empires. The conditions of this peace were not long respected by the northern government.

BUCH'OLZITE, an amorphous spotted mineral, so called in honour of M. Bucholz, the naturalist of Metz. It is of a glistening and pearly lustre, and scratches glass; but is susceptible of being scratched by quartz. It consists of silica, 46; alumina, 50; potash, 1·5; oxide of iron, 2·5. It has been found in the Tyrol.

BUCKINGHAM, JAMES SILK, Oriental traveller, writer, and public lecturer. He was born at Flushing, near Falmouth, in 1786. In his youth he was engaged in a variety of occupations, but chiefly as a compositor, which employment operated most powerfully in expanding his views, and influencing his future career through life. He also passed several years at sea.

Mr. Buckingham first became known to the public by his attempt to introduce freedom of journalism in India, at a time when the East India Directors were strongly opposed to all freedom of the press. He went to Calcutta about 1815, when Lord Moira was governor-general of India. His fearless conduct in attacking the abuses of the Indian government, especially his animadversions on a flagrant case of pluralism in one of the chaplains, who held the lucrative office of government stationer, led to his hasty expulsion from the Presidency. His establishment was broken up, and his printing materials confiscated. The injustice of these proceedings has been admitted by the fact that in more liberal times the East India Directory granted him a pension, which he enjoyed only for a few years before his death. The removal of restrictions on the press in India was afterwards effected by the liberal policy of Sir Charles Metcalfe and Lord William Bentinck.

Mr. Buckingham went to Calcutta a second time. Passing through various countries, he afterwards published a narrative of his travels, which attracted considerable attention in the literary world. In 1822 he brought out his 'Travels in Palestine;' in 1825, his 'Arabia;' in 1827, his 'Mesopotamia and Adjacent Countries;' and in 1830 appeared his 'Assyria and Media.' Our adventurous traveller did not, however, confine his views to the Eastern world, in which for many years he had taken so deep an interest. At a subsequent period he made tours in various parts of Europe and North America. He published his European travels, in two volumes, on Belgium, the Rhine, and Switzerland; and two on France, Piedmont, and Switzerland. His account of North America occupied no less than ten volumes,—three devoted to the Northern States of the Union, three to the Slave States, and three to the Eastern and Western States, and one to Canada, Nova Scotia, and New Brunswick. All these works contained much valuable information, connected with the statistics and social condition of the countries through which he passed. In 1825 he established in London his 'Oriental Herald,' which was the precursor of several journals of the kind, some of which still continue to flourish, although Mr. Buckingham was not successful in his own undertaking. He was also the founder of the 'Athenæum,' with which he was unsuccessful, but which afterwards became, and still remains, a flourishing property.

Mr. Buckingham, however, was better known by his lectures than by his publications. The subjects on which he lectured were all of a popular character, and chiefly connected with his travels in different parts of the world. His practical acquaintance with the places and countries on which he treated imparted additional interest to these lectures. For many years they were his chief occupation in different parts of the country;

and from thence he derived his principal subsistence.

In the first reformed Parliament, which met in 1832, Mr. Buckingham was elected M.P. for Sheffield, and he retained his seat until 1837. In his political course he chiefly took part in those great questions connected with social reform; and in 1849 he published a volume entitled 'National Evils and Practical Remedies,' in which his views and opinions were developed on a variety of topics of public interest. He was president of the London Temperance League, which was formed in 1851; and the temperance movement had in him one of the most zealous advocates of the time.

Notwithstanding all his industry and enterprise, Mr. Buckingham was generally in straitened circumstances; and in 1843, in order to obtain an established position, he endeavoured to form a literary club in Hanover Square, to be called the British and Foreign Institute. For its management he was to receive £1,000 per annum; but after two or three years of struggling existence, the institution was finally dissolved. The last efforts of his pen were devoted to his 'Autobiography,' which promised to be exceedingly voluminous; but death terminated his labours and his chequered life in 1855.

BUCKINGHAM PALACE; so called from having been built by John Sheffield, duke of Buckingham, in 1703. It became royal property in 1761. Old Buckingham House was pulled down in 1825, and a new palace built, at an expenditure of nearly one million pounds sterling, which was taken possession of by Queen Victoria, on the 13th of July, 1837. It has since been several times altered and improved.

BUCKINGHAMSHIRE (iii. 895-9). According to the census of 1851, the entire population of the county was 163,554; of which 80,990 were males, and 82,564 females. Of houses, inhabited and uninhabited, there were 34,366. The population of the principal places was as follows:—

Amersham ..	2,093	High Wycombe	3,588
Aylesbury ..	26,794	Ivinghoe ..	2,024
Beaconsfield ..	1,684	Newport-Pagnell	3,312
Brill	1,311	Olney	2,265
Buckingham mun.	4,020	Prince's Risboro'	2,317
—— parl.	8,069	Stoke-Pogis ..	1,501
Burnham ..	2,142	Stony-Stratford	1,757
Chalfont ..	2,651	Wendover ..	1,937
Chesham ..	2,496	West Wycombe	2,000
Eton	3,796	Winslow ..	1,889
Farnham ..	1,298	Woburn ..	2 026
Great Marlow	6,523	Wolverton ..	2,070
Gt. Missenden	2,097		
Hambleden ..	1,365		

BUCKLER, a kind of shield, worn by ancient warriors on the left arm. It was at first made of osiers bound together, or a light kind of wood, covered with hides and metal plates. Bucklers were of various shapes, and often highly ornamented. The Greek *clipeus* was originally of a circular form, and large enough to cover the whole man. The Roman *scutum* differed from the Greek *clipeus* in being adapted to the form of the human body, and was generally of an oval shape. The shield was held on the left arm, by means of a handle, and covered the left shoulder. (Smith's *Dict. of Antiquities.*)

BUCKLEY, REV. T. W. A., was born in 1825, and early distinguished himself as the author and translator of numerous classical works. For Mr. H. G. Bohn he revised, and adapted to modern texts of the originals those relating to Homer, Sophocles, Æschylus, Euripides, Aristotle, Horace, and Virgil. For Messrs. Routledge and Co. he edited Chaucer's Canterbury Tales, Milton's Poetical Works, Calmet's Biblical Dictionary, and other works. He also wrote the Great Cities of the Ancient World, the Great Cities of the Middle Ages, History of the Council of Trent, and other works. Independently of these he was a general contributor to some of the leading periodicals of the day. He died in 1856.

BUFONI'DÆ (Lat. *bufo* a toad, and Gr. εἶδος like), a family of amphibious creatures, of which the bufo, or toad, is the type. They are extremely repulsive in appearance, but perfectly harmless, and possess none of the venom which has been universally attributed to them. The eye of this tribe is peculiarly beautiful.

BU'FONITES, a name for the fossil teeth of the Pycnodont family of fishes. They occur in great abundance in some of the oolitic strata.

BUGEAUD, MARSHAL, DUKE OF ISLY, a French general distinguished for his military skill in Algeria and Morocco, and especially for his celebrated victory over the Moors at the battle of Isly, in 1844. He was born at Limoges in 1784. In his early youth, having a strong predilection for the army, and his views being thwarted by his family, he ran away from his paternal roof, and enlisted as a private soldier. He served under Napoleon in many of his great campaigns, and was engaged in some of his severest battles. After the memorable battle of Austerlitz (so glorious to the French arms) young Bugeaud was promoted on the field for his bravery to the rank of corporal. He then rapidly advanced through the various grades of his profession, until he attained, in 1832, the rank of general. On the accession of the Orleans family to the throne of France, he was much favoured by Louis Philippe; and his great attachment to the cause of his sovereign led to his appointment, in 1833, of commandant of Blaze, a fortress in which the Duchess of Berri was imprisoned. The French occupation of Algeria afforded scope for his talents. On the return of General Clausel to Europe, General Bugeaud was sent with a large force to repel the attacks of Abd-el-Kader, and at the same time to relieve Oran and Tlensan. In 1837 the French were desirous of purchasing the neutrality of the Arab chief; and General Bugeaud very judiciously succeeded in making a treaty with him, from which the French were enabled to effect the important conquest of Constantina, and subdue the mountain warriors of the Kabyle.

In 1840 the French were again exposed to the predatory attacks of Abd-el-Kader; and Marshal Bugeaud was engaged in many severe conflicts

with this daring chieftain. In 1841 the general succeeded in regaining Mascara and the Matidja plain from the Emir, and routed the Arabs in various encounters. In 1844 this chief, having been compelled to take refuge in Morocco, induced the Moors of that country to unite with him in hostility to the French. Hence arose the war between the Emperor of Morocco and France, in which the military talents and skill of Bugeaud soon compelled the Moorish sovereign to sue for peace. The decisive battle of Isly brought the contest to an issue, and led to the eventual overthrow of Abd-el-Kader, who, by the terms of the treaty, was not to be allowed to remain in the Moorish territories. After this victory Bugeaud was created Duke of Isly, and received the baton of field-marshal.

Marshal Bugeaud was a warm and valuable supporter of Louis Napoleon to the last hour of death; and for him the president of France had the highest regard. He died at Paris, of cholera, in 1849.

(Christian's *Souvenirs du Maréchal Bugeaud de l'Algérie; Esquisse sur l'Administration de l'Algérie depuis* 1836, &c.)

BUILDINGS, HEIGHTS OF. Different measurements have been made of the respective heights of some of the principal buildings in Europe, and the following are the results, as compared with the great pyramid of Egypt.

	Feet.
Highest pyramid of Egypt . . .	479·27
Cathedral of Anvers	472·66
Cathedral of Strasburg	466·27
Spire of St. Stephen's, Vienna . .	452·95
Spire of St. Martin's, Landshut .	419·75
Cupola of St. Peter's, Rome . . .	433 76
Spire of St. Michael's, Hamburg .	428·43
Cathedral of St. Paul's, London .	361·02
Cathedral of Ulm	359·6
Cathedral of Milan	358·09
Towers degli Asinelli, at Bologna .	351·07
Dome of the Invalides, Paris . .	344·66
Cathedral of Magdeburg . . .	333·58
Cupola of the Pantheon, Paris . .	259·03
Balustrade of Notre Dame . . .	216·67

BULJANAK, a small river in the Crimea, taking its rise near Simferopol, on the banks of which the first encounter between the allied troops and the Russians, in the recent war, occurred. This was a cavalry skirmish, in which about 1500 Cossacks, supported by artillery, endeavoured to entice 500 British horse, of the 8th and 11th Hussars, and the 13th Light Dragoons, into a snare. It took place on the 19th of September, 1854, the day before the battle of the Alma. A few English were wounded, and the Russians are supposed to have lost about a dozen men. (Russell's *Letters on the War.*)

BULLA, a small golden ball or medal worn by the Romans on the left side of the breast, sometimes in the shape of a heart. In every family they placed as many little images about their household gods as there were sons in the house. When the bulla was left off by a youth, which was when he arrived at puberty, it was hung about the neck of his respective image as an offering. Hence Petronius, 'Lares bullatos supra mensam posuerunt." The sons of the lower orders wore only a leathern cross. The necks of horses, as well as those of gods and men, were sometimes decorated with these ornaments. These bullæ came afterwards to be hung to the diplomas of emperors and popes, whence the name of BULLS, assumed by the Pope of Rome. (Adam's *Roman Antiq.*)

BULLI'NÆ, a sub-family of Mollusca, in which the body of the animal is oblong. The branchiæ are dorsal, and covered with a convolute shell, without a spine, and with a wide base. They have no tentacula. The Bullas is the type of the family.

BUNGALOW. A house consisting of a single floor is called in India a bungalow. Dâk-bungalows are thatched cottages, erected at certain intervals, in many parts of India, for the accommodation of travellers.

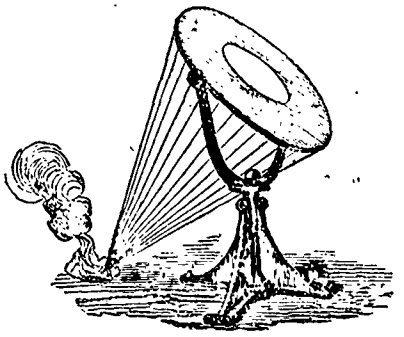
BURGHERS, a large sect of seceders from the Presbyterian Church of Scotland, who were so called from their assenting to the Burgess oath, which in 1745 was administered in several of the royal burghs of Scotland. They were originally connected with the Associated Presbytery; but in consequence of differences having arisen about the lawfulness of the burgess oath, a separation ensued. Those who objected to the burgess oath were named *Anti-burghers*, and both sects were for many years in powerful rivalry; but a greater part of the latter body is now united to the Burghers, and both form what is called the United Session Church. Among the Burghers the supreme court is styled the Burgher Association Synod, of which there is one in Scotland and another in Ireland. The synod in Scotland is subdivided into ten presbyteries, and that of Ireland into four. The constitution of the Antiburgh society differed very little from that of the Burghers. It had three synods in Scotland—at Edinbugh, Perth, and Glasgow,—which consisted of three presbyteries each. It had also the synod of Ireland, which consisted of five presbyteries.

BURKE, JOHN, author of the 'Genealogical and Heraldic Dictionary of the Peerages,' &c., was born at Elm Hall, Parsonstown, Ireland, in 1787. His whole literary career was connected with works of a genealogical character; and few men laboured more ardently in the particular field to which he turned his attention than our author. Besides the above, he published, in 1832, a genealogical work, entitled 'The Commoners of Great Britain,' in four large octavo volumes. He also re-edited, in a compressed form, 'A Genealogical and Heraldic Dictionary of the Landed Gentry of Great Britain and Ireland,' which appeared, in 1846, in two volumes. He was also the author of numerous other works of a similar character, as 'A Genealogical and Heraldic History of the Extinct and Dormant Baronetcies of England,' 'A General Armoury of England, Scotland, and Ireland,' 'Portrait Gallery of Distinguished Females,' 'Heraldic Illustrations,' 'Royal Families of England, Scotland, Wales,' &c. He died in 1848.

BURKING, CRIME OF. The high price

given by medical practitioners for subjects for dissection induced a man named Burke, with an accomplice, Hare, to commit several inhuman murders. They carried on their wicked practices at Edinburgh, generally taking the life of their victims by means of suffocation. Burke was executed at Edinburgh on the 28th of January, 1829, and the execution led to a scene of great confusion. Before suffering the extreme penalty of the law, Burke confessed to more than a dozen murders. Another form of this dreadful species of crime was afterwards revived in London, and occasioned much alarm among the inhabitants. Two men, named Bishop and Williams, were at last caught, convicted, and, having confessed to several murders, suffered the extreme penalty of the law, on the 5th of December, 1831.

BURNING GLASSES (iii. 954) have the property of converging parallel rays to a focus, by which a burning temperature may be produced, especially from the sun's rays. The annexed is the representation of such an instrument. It will



BURNING-GLASS.

be here seen that the parallel rays of the sun falling on the great convex lens are made to converge to a focus; and this convergence may be wonderfully increased by a second smaller lens. Any small object being exposed, at the focal point, to the full action of the sun's concentrated rays, its temperature is instantly raised to a burning point. In such a focus there are few substances that can withstand the heat. Brick, slate, and other such earthy matters instantly boil; while metals melt, and even volatilize away. It has been found that, by the use of these instruments, a piece of silver, when held over gold fused at the focus, becomes gilded over by the vapour that rises from the melted mass. In the same way gold can be whitened by the vapours of melted silver. The heat attained in this way far exceeds that of the best-constructed furnace; and in some respects answers the purposes of the blow-pipe. (Professor Draper's *Natural Philosophy.*)

BURYING ALIVE. This mode of punishment was resorted to by the Jewish people. In ancient Rome it was inflicted upon vestal virgins who violated their vows, and was practised among the Goths.

BUSTUA'RII (Lat. *bustum* a funeral pile), among the Romans were gladiators who fought bout the funeral pile of a deceased person of distinction. This custom succeeded the more barbarous one of sacrificing captives upon the occasion, instances of which are met with both among the Roman and Greek writers. The blood spilt in this inhuman butchery was supposed to render the infernal gods more propitious to the souls of the dead. According to Valerius Maximus and Florus, the sons of Brutus were the first at Rome who had honoured the funeral of their father with this kind of spectacle, A.R. 489.

BUTESHIRE, in Scotland (iii. 967). According to the census of 1851, the population of the county was 16,608, and that of the principal islands was as follows:—

Aroan	5,947	Cumbray Islds.	1,275
Bute Island ..	10,661	Rothesay ..	7,354

BUTTER OF ANTIMONY, now known in chemical language as the *Terchloride of Antimony.* It was formerly termed *Butter* or *Oil of Antimony*, &c. It is produced by the distillation of a mixture of Bichloride of Mercury (*corrosive sublimate*), and Tersulphuret of Antimony. The Terchloride of Antimony distils over, and congeals, on cooling, into a yellowish white substance, which is thought to resemble butter in its appearance, and hence its name. The residue remaining in the retort is Bisulphuret of Mercury, and is commonly termed *Cinnabar of Antimony.*

The above compound, which is the *True butter of Antimony*, is seldom seen but in chemical laboratories; the deep brown liquid, sold as butter of Antimony in the shops, being a solution of the Terchloride in excess of hydrochloric acid. It is generally obtained by digesting the Tersulphuret in Hydrochloric Acid. As thus obtained it is a pale, transparent, yellowish liquid; but as there is a vulgar impression, that the darker in colour the stronger it is, solution of Pernitrate of iron is added to it, producing a deep red shade. It acts as an energetic caustic, and is much used by farmers, &c., as an application to the feet of sheep for foot-rot. It is only employed in medicine as a caustic, and has sometimes been used as an application to parts bitten by rabid animals or venomous serpents; for which purposes its liquidity adapts it for penetrating into and corroding all parts of the wound.

BYTTNE'RIA, a genus of plants, type of the natural order Byttneriaceæ, so called from D. S. A. Byttner, professor at Gottingen. The order is composed of trees and shrubs, chiefly tropical. The Byttneria has a naked calyx; the petals hypogynous, and five in number; stamens five, or a multiple of five. It is of the class Pentandria of Linnæus, and order Monogynia. (Paxton's *Botanical Dict.*)

C.

CAABA.

CA'ABA, a large square house of great antiquity, in the temple of Mecca, which forms the object of Mahommedan veneration. There are many legendary stories about its origin; but the most prevalent, and that which is devoutly believed by its worshippers, is, that the archangel Gabriel presented it to the patriarch Abraham, by whom it was handed down, through a succession of ages, to the faithful followers of the prophet. (Craig.)

CAB'BALA, a Hebrew term, signifying tradition, and denoting the pretended secret science of the Jewish Rabbins, by which they were enabled to interpret difficult passages in Holy Writ. It consisted of certain combinations of words, letters, and numbers, in the Scriptures, from which they drew many fanciful conclusions. The professors of this art were usually styled Cabbalists; and they also pretended to a knowledge of spirits, and the power of invoking them.

CACHOU AROMATISE. This term is applied to the little pills or pastilles made use of by smokers and others for disguising the odour of tobacco, &c., or imparting an agreeable odour to the breath. They were originally prepared by the Italians, and are likewise termed Aromatic Pastilles of Catechu, and Cachou de Bologna. They are said to have been originally composed of a mixture of catechu, gum arabic, mastic, cascarilla bark, orris root, and charcoal, added to a solution of Spanish liquorice in an equal weight of water, and scented with peppermint, ambergris, and musk; then divided into little pills, and coated with gold or silver leaf. As prepared in this country, they consist of Spanish liquorice disolved in water to form a mass of the proper consistence, and are then variously scented with cloves, cinnamon, &c., according to taste, and lastly covered with gold and silver leaf as above.

CADU'CA BONA among the Romans, a term appplied to lapsed legacies, or gifts of inheritance, which in law had become void. According to certain laws made in the time of Augustus, they were goods which, as escheat, had become forfeited to the treasury.

CAERMARTHENSHIRE, in Wales (iii. 1011-14). According to the census of 1851, the population of the county was 110,632; and inhabited houses, 22,465. The population of the principal towns was as follows:—

Caermarthen	10,524	Llanelly ...	13,663
Kidwelley, or		——— bor.	8,710
Cydweli ...	1,648	Newcastle	
Langhorne ...	1,481	Emlym ...	1,049
Llandovery	1,927		

CAERNARVONSHIRE, in Wales (iii. 1014). According to the census of 1851, the population of the county was 87,870; and the inhabited houses, 18,005. The population of the principal towns was as follows:—

Bangor ...	9,564	Conway ...	1,528
——— bor.	6,338	——— bor.	2,105
Caernarvon ...	8,674	Nevin, or Nefyn	1,854
Crickerth, bor.	530	Pwllheli ...	2,709

CÆSARE'AN OPERATION, in midwifery, an operation which consists in making an opening into the abdomen of the mother, in order to extract the child, after her death, or otherwise, when her delivery is not to be obtained in the natural way. It is so *named* from Julius Cæsar, who was thus brought into the world.

CAINITES, an early Christian sect, who were a branch of the Gnostics. They received their name from Cain (the brother of Abel), whom they esteemed as a patriarch, and looked upon him as an object of veneration. For it is to be observed that Cain's descendants became the inventors of almost all the useful arts of social life. Hence they were the patriarchs of eastern antiquity.

CAITH'NESS, County of, in Scotland, (iv. 16). According to the census of 1851, the population of the county was 38,709, and the inhabited houses 6,952. The population of the two towns was as follows:—

Thurso pa. ...	5,096	Wick t. ...	1,185
——— bor. ...	2,908	——bor. ...	6,722

CALA'DIEÆ (Lat. *caladium*, one of the genera), a family of plants belonging to the natural order Araceæ, of which there are many interesting species, with singularly-spotted stems, and green foliage. The *Caladium seguinum*, or dumb cane, is a species which grows five or six feet high, and is a native of South America and the West Indies. When chewed, it has the power of swelling the tongue, and suspending the power of speech. It is mentioned by Dr. Hooker, that a gentleman incautiously bit a piece of this caladium, when his tongue swelled to such a degree, that it lost the powers of motion, and for several days the man was deprived of the power of speech. The same authority also states that its juice will impart an *indelible stain to linen*. The plant is also employed to bring sugar to a good grain, when it is too viscid, and cannot be made to granulate by the usual process. (Dr. Hooker; P. Brown.)

CALATO'RES, Roman officers, whose duty it was to precede the great Pontiff when he went to offer sacrifice. They were attendants on the magistrates, and were employed to call the people to the public sacrifices, to the comitia of the citizens, and other public assemblies.

CALCULATING MACHINES (iv. 28-30). We have already given some historical notices of the different machines which the ingenuity of man at different times has devised for the purpose of facilitating the processes of arithmetical calculation. But the *Arithmometer*, at which Mr. Thomas, of Colmar, has been working for the last thirty years, appears to be the finishing improvement. This instrument may be used without the least trouble or possibility of error, not only for the primary rules of arithmetic, but for all the more complex operations of figures. Thus a multiplication of eight figures by eight others, is made in eighteen seconds; a division of sixteen figures in twenty-four seconds; and in one minute and a quarter the square root of sixteen figures may be extracted, and the accuracy of the calculation proved. The Arithmometer adapts itself to every sort of combination. As an instance of the wonderful extent of its powers, it can furnish, in a few seconds, products amounting to thirty figures. At the same time the working of the instrument is extremely simple. To raise or lower a nut-screw, to turn a winch a few times, and by means of a button to slide off a metal plate from left to right, or from right to left, is the whole secret. Instead of repeating responses dictated to it, this instrument instantly dictates the proper answer to the person who asks a question. The Arithmometer is already used in many great financial establishments, where considerable economy is realised by its employment.

CAL'FINE, the spirituous solution of an oil procured from the bark of the birch. It is made use of by brewers, in order to impart a peculiar flavour to porter.

CAL'ICES (Lat. *calyx* a cup), a name applied to the cups or vessels of classical antiquity, and especially of the Romans. They are usually represented with two or four handles, and are to be seen in most of our museums, public and private. Among the Roman writers they are known by a variety of names, according to their shape and material. The *calices audaces*, for instance, were made of glass, and resembled natural crystal. The *calices allapontes* were also of glass, but variously coloured, and of beautifully-changing hues; these were chiefly manufactured in Egypt. The *calices diatriti* were very skilfully wrought, and of brittle material. The *apteroti*, or *pleroti*, were raised in forms of wings, and made with or without handles. (Nuttall's *Class. Dict.*)

CALIFORNIA (iv. 41). This important territory, extending about 1300 miles along the shores of the North Pacific, formerly belonged to Spain, and afterwards to Mexico; but on the termination of the contest between America and the latter power, in 1848, the Upper Province of California was ceded to the United States, and has since been admitted into the Union. From that period, a most extraordinary change in its social position has taken place, owing to the discovery, in 1848, of extensive fields of auriferous deposits, which were found embedded in the valleys of the Sierra Nevada. These golden treasures were first accidentally observed on the south fork of the American river (a tributary of the Sacramento), at a place called Coloma. The discovery was effected by some settlers, who were excavating a mill-stream in the neighbourhood. In the course of their work they met with several pieces of heavy yellow-coloured metal, which, being of a sufficiently peculiar nature to excite curiosity, were submitted to analysis, and discovered to be pure gold. For some time the secret was preserved; but it eventually became known; when all other pursuits were instantly forsaken. Thousands flocked to the 'diggings,' as they were called, and wages, as well as provisions, rose to an exorbitant price. During the following winter information of the discovery spread on every side; and, in 1849, immigrants of every country and of all classes—Americans, Mexicans, Peruvians, Chinese, &c., crowded in swarms to the gold-bespangled regions of the Sacramento and its various tributaries. During the progress of investigation, it was found that the gold deposits were not confined to the Sacramento, but extended over a country 600 miles in extent. Thus explorations were made as far south as King's River, which flows into the great Tulare Lake. Above this are the numerous tributaries of the San Joaquin; upon all of which the auriferous deposits have been found. The two great streams, however, which, with their tributaries, encircle this golden region, are the Sacramento and San Joaquin. Throughout the whole territory (as we learn from Mr. Commissioner King's official report), there is scarcely a stream, valley, hill, or plain, in which gold does not exist. Throughout the range on the original slope of the Sierra Nevada, and in every little hill which branches from it, runs a formation of quartz rock, found sometimes at a few feet below the earth's surface, and sometimes rising above it in huge solid masses. This rock, throughout the whole mining districts, has been found to be richly impregnated with gold; and it moreover appears, that the gold washings, which have thus far enriched thousands, are but the scum or mere debris that has been washed from the primeval beds of the ore. The geological formations in which gold occurs are the crystalline primitive rocks, the compact transition strata, the trachytic and trap rocks, and alluvial grounds of the current era. In the three former sources, the ores of the metal are *in situ*; in the latter it is a travelled or transported product, being carried thither from the rocks in which it was originally formed, by streams and rivers. In the former case, it is obtained by the difficult and dangerous process of mining; in the latter, the soil or gravel is merely turned over, and the metallic portions (the gold dust of commerce) separated by hand-picking or washings.

Commissioner King's report is highly interesting, both in a scientific and statistical point of view. 'The dry diggings,' says he, 'are places where quartz containing gold has cropped out, and been disintegrated, crumbled to fragments, pebbles, and dust, by the action of the water and the atmosphere. The gold has been left as it was made, in all imaginable shapes; in pieces of all sizes, from one grain to several pounds in weight. The evidences that it was created in combination with quartz are too numerous and striking to ad-

mit of doubt or cavil. They are found in combination in large quantities. A very large proportion of the pieces of gold, found in these situations, have more or less quartz adhering to them. In many specimens they are so combined that they cannot be separated, without reducing the whole mass to powder, and subjecting it to the action of quicksilver. These diggings, in some places, spread over valleys of considerable extent, which have the appearance of an alluvion, formed by washings from the adjoining hills, of decomposed quartz and slate, earth and vegetable matter.'

The produce of gold obtained from these diggings has been enormous, and has largely contributed to the wealth and commerce of the United States, as well as to the prosperity of California. According to the official accounts which have been laid before the world, the shipments of gold and gold dust from St. Francisco, between Sept. 1, 1849, and Dec. 13, 1850, amounted to 31,000,000 of dollars, or upwards of six millions sterling, independently of four millions brought away by passengers; and that from June 1848, when gold was first discovered, to the end of 1850, the whole amount exported from California exceeded twelve millions sterling. The amount imported into New York, from Jan. 1851 to August 12th, was calculated at ten millions sterling; thus realising, in so short a period, a sum total of twenty-two millions of gold. Since that period the exports of the precious metal have been largely on the increase; but owing to the great expansion of trade and commerce throughout the American Union, as well as in Europe, there has been no perceptible depreciation in the standard value of the precious metal. The value of gold sent to the United States in 1852, besides private removals, was 46,528,076 dollars.

The following is the official return made by the United States up to January 1854:—

	Dols.
Total product of the mines to Jan. 1st, 1852	140,931,103
Product of 1852	67,699,548
Product of 1853	92,000,000
	300,630,651

Since that period the annual produce has been rapidly increasing.

The extensive desert region lying east of the Sierra Nevada is presumed also to be rich in auriferous deposits. About lat. 33 N., and 100 miles west of the Colorado, is situated what is emphatically called the 'Gold Mountain,' from the immense quantities of the precious metal it contains. The rock is composed of hornblende, intermixed with white feldspar, and the gold is found copiously running in both. But unfortunately the rock, which rises about 450 feet from a ridge of hills, is almost inaccessible. Moreover, to arrive at this locality, deserts of sixty or eighty miles must be crossed; and in its locality there is neither grass, trees, nor water. But such, generally speaking, is the geological aspect of California, east of the Sierra Nevada.

The political history of California, from the period of the gold discovery, is unparalleled in the annals of any age or country. By the treaty of Guadalupe Hidalgo, California was ceded by Mexico to the United States, and the discovery of the gold region occurred in little more than a month after that event. This produced a complete revolution in society, overturning all established laws and every existing branch of trade, industry, or occupation. In fact, all government was completely annulled. Mexico and the United States poured forth their thousands of adventurers into the country, which soon outnumbered the native population. There was neither government nor police in the country; and the emigrants were totally unacquainted with the Spanish laws, by which the property and affairs of the settlers had hitherto been regulated. Robbery and murder were committed with impunity; and the state of affairs was most critical. A species of Lynch law prevailed, by which any man charged with murder or theft, was tried by a judge and jury selected on the spot, and, if found guilty, immediately executed. In this dilemma the Americans in the country displayed their singular capacity for self-government, by promptly and unanimously adopting the prudent course of forming themselves into a State. In June 1849, representatives were chosen in all parts of the country to meet for the purpose of forming a constitution, and framing a general code of laws. On their assembling, a species of constitution was adopted, which, after reciting the general principle that all men were by nature free, and that all power was inherent in the people, proceeded to recapitulate and guarantee the following rights and immunities:—Right of trial by jury; the free exercise of religious worship; the privilege of the writ of *habeas corpus*; protection from excessive fines or cruel punishments; exemption from arrest on crime, except on presentment or indictment; freedom of speech; right of petition; prohibition of a standing army in time of peace; representation according to population; abolition of imprisonment for debt; protection of rights of property, &c. At present the government of California consists of a governor, a senate, and a house of representatives. The State sends two representatives to Congress. The judiciary comprehends a supreme court, with one chief judge, and two subordinate ones, elected by the people for six years. There are also several district and county courts. But notwithstanding these judicial arrangements, there have been some recent instances of the armed population taking the law into their own hands, and executing criminals according to the principles of Lynch law, as it is there denominated. In 1856, there was in existence what was called a 'Committee of Vigilance,' who superseded the regularly-constituted authorities. They arrested judges and other officials, and almost the entire population took up arms to sustain their authority: their professed determination being to put down the vice and corruption which pervaded the governing body, or altogether to supersede it, under the plea that when the local government fails in its duty, the right of re-electing another rests entirely with the people themselves, and not with the federal government of the United States.

With the establishment of a local government,

and the continued produce of gold, the commerce and social prosperity of the country has been rapidly increasing. In 1852, 718 ships entered the ports, and 90 cleared out; and according to the returns of 1853 there were 23 churches, several academies, and 20 schools attended by 3314 pupils. The population in 1852 was 264,435; and it has since been rapidly increasing.

Previous to the treaty of peace with Mexico, and the discovery of the gold dust, the exportable produce of the country consisted chiefly of hides, tallow, wheat, wine, raisins, olives, and brandy. At Francisco, a moderate commerce was carried on, and vessels from Europe took away hides, skins, tallow, wheat, dried salmon, and other products, in exchange for cloths, cotton fabrics, velvets, silks, brandies, wines, and teas. Monterey, San Diego, New Helvetin, San Gabriel, the City of Angelo, and San Buenaventura, were the other chief towns; and each of these, through the trade fostered by European energy, rose to a certain stage of prosperity. But the commercial resources of California are at present almost entirely founded on her metallic treasures. Since 1849, new towns and harbours have been rapidly rising into importance. While the old places are falling into insignificance, many thriving towns have sprung into existence in the vicinities of the 'diggings.' The city of Sacramento, situated on the eastern bank of the river of the same name, is one of these. According to recent accounts, the population, which chiefly consists of emigrants from the western States, was above 20,000. Among the new towns may also be mentioned Coloma, Georgetown, Placerville, Diamond Springs, and Mud Springs. The new city of Casteria, and the town of Stockton, are thriving places. Pueblo San José, about five miles from the extremity of the Bay of Francisco, is beautifully situated, and one of the most flourishing of the inland towns. The climate, situation, and fertile valley in which it stands, render it one of the most favoured spots in the country.

According to accounts from San Francisco, dated Oct. 1857, things appear to have settled down to their natural course. The grain of California was found to be much more abundant than absolutely required for home consumption; and the necessaries of life, instead of being, as formerly, at extravagant prices, were then obtainable in great abundance, at very moderate rates. The lending of money at exorbitant interest had also ceased, owing to the large accumulation of capital in the hands of the industrious classes, and other favourable circumstances. The amount of gold exported during the nine previous months of 1857 was 35,162,047 dollars, which shows a decrease on the same period of the preceding year of 1,960,886 dollars,—a fact which shows that the increasing prosperity of the country has a tendency to absorb a larger proportion of the metallic currency for the purposes of trade and commerce.

CALIFORNIA first received its name from the Spanish words *caliente fornella* (a heated furnace); the Southern parts of Lower California being at times subject to the most intense heats. But Upper California, to which we shall confine our remarks, having now assumed an unexpected degree of importance in the geography of the world, a few additional details, gleaned from the most recent and authentic sources, may be interesting.

Upper California, formerly known as New Albion, extends south to north 600 miles, from the mouth of the Colorado river, lat 32° N., to Oregon, lat. 42°. It is bounded W. by the North Pacific (Cape Mendocino, long. 124°, being the western extremity), and E. by the Rocky Mountains about long. 109° W. According to the recent treaty, between the Republics of the United States and of Mexico, the S. and S.E. boundary commences near the Gulf of Mexico, three leagues from land, and runs up the middle of the Rio Grande, in its intersection with the S. boundary of New Mexico; thence N. until it intersects the first branch of the Gila; then down the middle of that branch of the river to the Colorado; and thence it follows the division between Upper and Lower California to the Pacific, which it strikes one league S. of San Diego. The whole territory is estimated to contain 500,000 square miles.

The coast line, along the Pacific, is of a highly diversified character. The country is clothed in the season with the finest herbage, consisting either of different grasses, or of wild oats, which grow most luxuriantly; though in the latter part of the dry season it has a burnt-up appearance. North of the 39th degree of lat. there are extensive forests, which are fitted for inexhaustible supplies of valuable timber; but below the 39th deg. the forests are limited to some scattered groves of oak in the valleys, and along the borders of the streams. The principal features of the country, between the Ocean and the Sierra Nevada, are the Sacramento and Joachin rivers, and the great bay or inlet of the sea, called San Francisco, into which these two noble rivers fall.

Professor Shepherd, who explored almost every part of California, speaks in the highest strains of the physical aspect of the country generally. We shall quote his own words. 'I have now explored California for nearly two years. I can truly say it is a land of wonders. There are fresh flowers every month in the year, and winter now wears the bloom of spring. I have found waterfalls three and four times as high as Niagara; natural bridges, of white marble, far surpassing in beauty that of Rockbridge, Virginia; some thousands of gold-bearing veins, inexhaustible quantities of iron and chrome, cresslead, bismuth, and quicksilver, most beautiful porcelain clay, and, in short, everything that can bless an industrious and enterprising people. In one valley I found more than forty springs over one hundred degrees Fahrenheit. In another valley, sixteen geysers, like the famous one in Iceland. In this famous abode of Vulcan, the rocks are so hot, that you can stand upon them but a short time, even with thick boots on. The silicious rocks are bleached to snowy whiteness, and brecciated and conglomerate rocks are now actually forming. The roar of geysers at times may be heard a mile or more, and the moment is one of the most intense interest as you approach them.'

The principal range of mountains in California is the Sierra Nevada, which divides the country into two great sections,—the western, which extends to the Pacific, and the eastern, which stretches to the Rocky Mountains. The Sierra, under different names, and with different altitudes, varying from 5000 to 10,000 feet, runs in an almost unbroken chain for 600 miles from the S. to the N. extremities of California, and from 150 to 200 miles from the coast. It is remarkable for its parallelism and comparative proximity to the sea, and its numerous volcanic peaks, towering far above the line of perpetual snow. There are many beautiful valleys and mountains among the foot hills of the Sierra Nevada, which, if properly cultivated, would support a large population. The great valley of the Colorado has indications of rich fertility.

Since the discovery of the gold regions of California, the slopes of the Sierra Nevada have presented to the wondering eyes of the immigrants some of the most stupendous productions of vegetable creation, ever recorded in the history of the world. They were first discovered and made known by Mr. Lobb, who was sent out by Mr. Veitch, the celebrated nurseryman of Exeter. He proceeded to the highest range of mountains in California, the Sierra Nevada; and when he had ascended about 5000 feet, there suddenly burst upon his sight the most magnificent trees ever beheld. They were of enormous size; many of them being from 300 to 400 feet high, and 30 feet in diameter. These mammoth trees are about ninety in number, being scattered among other smaller ones, and all within a mile of each other. They are a new species of the order Coniferæ, and have been named, by Professor Lindley, *Wellingtonea Gigantea*. The wood is light and soft, and of a reddish colour like the cedar. The trees have all been designated by some appropriate and romantic name; as the 'Three Sisters,' the 'Old Bachelor,' the 'Family Group.' the 'Beauty of the Forest,' &c. The largest tree of the collection is the 'Father of the Forest,' which measures at the base about 40 feet in diameter, It now lies prostrate, and is supposed to have fallen about 50 years ago, as it appears in a state of decay. It is supposed, when standing, to have been 450 feet high. Among this wonderful collection, however, the one designated as the 'Mother of the Forest,' was found to be the largest perfect tree, and contained more timber than any other. It is the bark of the trunk of this enormous tree which is now exhibiting at the Crystal Palace at Sydenham; and it is thus described in the catalogue:—'Full height, 363 feet; diameter at base, 21 feet; diameter 100 feet from base, 15 feet; bark 18 inches thick; age (as shown by the concentric rings), from 3000 to 4000 years.'

California produces a great variety of animals. Among the wild ones are bisons, bears, wolves foxes, wild cats, polecats, otters, beavers, hares, rabbits, and a profusion of game. Large herds of stags of a gigantic size, with horns of a corresponding magnitude, and great swiftness, are found in the forest. The district of San Juan is known as the garden of California, affording pasture on its woody border to numerous flocks and herds; while among the forests swarm multitudes of animals, whose skins once formed a material of considerable traffic. Live stock are the staple produce; and so far back as 1831 the stock was estimated to comprise 216,000 cattle, and 155,000 sheep, besides horses and numerous herds running wild. In 1849 the stock of cattle was estimated at about 500,000 head, and the sheep at about 160,000. The grizzly bear is the most formidable and ferocious animal in California. A full-grown one measures from eight to ten feet in length, and four or five in girth. His strength is tremendous; his embrace is certain death.

The principal rivers of California are the Sacramento, the San Joachin, the Colorado, and the Buenaventura. The Sacramento flows from N. to S., and the San Joachin from the S.; and after traversing extensive tracts of country they meet about midway between the ocean and the Sierra Nevada, whence they take their rise. They then discharge their united waters into the great Bay of San Francisco. The Sacramento is a noble stream, and is navigable for two hundred miles inland. Its width varies from 200 to 300 yards. Its principal tributaries are the Americanos, Los Plumas, and Bear River. Near the source of the San Joachin is Lake Chintache, and still further south, between lat. 35 and 36½°, are the Tule Lakes, of considerable magnitude, and surrounded by extensive swamps. The great river Colorado may be said to form the S.E. boundary of the country. It takes its rise in a range of mountains of the same name, and flows in a S.W. direction, about 600 miles, until it enters the Gulf of California. The San Buenaventura is also of considerable importance; it flows in a N.W. course of nearly 200 miles, and falls into the Bay of Monterey. The Featherstone, which commences below the foot hills of the Sierra Nevada, the Yuba, and the various tributaries of the Sacramento, are the localities where vast mining operations are now carried on.

Of the great valley E. of the Sierra, which is about 500 miles in width, and 700 in length, little is known. So far as it has yet been explored, it is covered with bleak and naked hills, with craggy peaks, plains without a vestige of verdure, or even a single tree, and numerous salt lakes. A few of the loftier hills, however, are covered with forests, whose shades afford retreat to the black deer and flocks of mountain sheep, with a few wandering aboriginal tribes. In the pass of the Rocky Mountains, to which this territory extends, wild precipices and deep defiles appear in dismal aspect. Some of the caravan travellers, however, who have travelled this extensive region, describe portions of it as richly clad with the wild Californian poppy, of a golden colour, intermingled with purple lilies and blossoming shrubs, that render the plains, when glowing with the light of sunset, one of the most gorgeous scenes in nature. Small streams burst from the earth at certain seasons, and increase in volume, until the heat of summer gradually exhales and dries them up, while the vegetation which they create vanishes with them,—only to

return on their re-appearance. The great Salt and Utah Lakes, are situated in the N.E. portion of this desolate region. The Salt Lake is more than 4000 feet above the level of the sea, and nearly 100 miles long. It is surrounded by a rocky margin, with rivers flowing into it, and whirlpools in the centre. In its vicinity the sect of Mormonites have recently established themselves.

(Commissioner King's *Report on California*; Taylor's *El Dorado;* Lieut. Buffum's *Explorations; Official Communications*, and *Private Information.*)

CALLICAN'THUS (Gr. *κάλλος* beautiful, and *ἄκανθος* a spine), a genus of fishes of the sub-family Acanthurinæ, with two caudal spines on each side, and ventral fins immediately under the pectral. The caudal fin is large, and appears lunated, with attenuated points.

CALLIDER'MES (Gr. *κάλλος* and *δέρμα*, a beautiful skin), a genus of fishes, with two spines on the sides of the tail; the body being without scales, and the tail lunated.

CALLIOS'TOMA (Gr. *κάλλος* and *στόμα*, a beautiful mouth), a genus of Mollusca, of the family Trochinæ, the shells univalve and smooth, the spine elevated and acute, the aperture broader than high, and transversely ovate.

CALLORYN'CHUS (Lat. *callus* a hard skin, and Gr. *ῥύγχος* a snout), a genus of fishes, with the snout terminating in a fleshy lobe curving over the mouth; the tail pointed, and the caudal fin surrounding it.

CALOTROPIS (Gr. *καλὸς* fair, and *τροπὶς* a keel), a genus of the natural order *Asclepiadaceæ*, Asclepiads, or the swallow-wort tribe. The *Calotropis procera* possesses an extremely acrid juice, which is said to have been used successfully in the treatment of Ringworm, and other kinds of cutaneous diseases. It is also a powerful depilatory, and Dr. Royle states, that a kind of manna is produced by this or a species nearly allied to it.

CALOTTE', in architecture, a concavity in the form of a niche or cup, which serves to diminish the height of a chapel or alcove, so as to prevent the place appearing too high for the breadth. It is also the name of a coif, formerly worn by the French cavalry under their caps.

CALU'RUS (Gr. *καλὸς* and *οὐρά*, a beautiful tail), a splendid genus of birds of the tribe Fissirostres, and of the Trogon family. The head is furnished with a compressed and elevated crest; and the tail-covers are so enormously developed as to hide the tail.

CALYM'ENE (Gr. *κάλυμμα* a veil or covering), a genus of fossil Trilobites, found in the Silurian rocks, which possessed the power of rolling itself into a ball. (Craig.)

CALYP'SO (Gr. *καλύπτω* to conceal, from its concealed habitation), a genus of perennial herbs, of the order Orchidaceæ; a native of N. America. In mythology, the Queen of Ogygia, and the reputed daughter of Oceanus and Tethys, who used all her arts to captivate and detain Ulysses, after being shipwrecked on her island by her enchantments.

CAMBRIDGE, ADOLPHUS FREDERICK, DUKE OF, the seventh and youngest son of George III. and Queen Charlotte, was born on the 24th February, 1774, and bore the name of Prince Adolphus for the first twenty-five years of his life. He received his earliest education at Kew, under the tuition of Dr. Hughes and Mr. Cookson; and was afterwards sent to Göttingen to finish his studies. In 1793 he was appointed colonel in the Hanoverian army, and served as a volunteer under his brother the Duke of York, in Flanders, during the early part of the campaign of that year. When serving under Marshal Freytag, in the latter portion of the campaign, he received two wounds, and was taken prisoner near Rexpoode, but rescued soon after by the Hanoverians. His Royal Highness continued to serve in the campaigns of 1794 and 1795, in General Walloden's corps, and bore an active part as Major-General in the arduous operations of the war. In 1798 he was appointed Lieut.-General in the Hanoverian service. In 1801 he was created a Peer of the United Kingdom; his titles being Duke of Cambridge, Earl of Tipperary, and Baron of Culloden. At the same time, Parliament voted him an annuity of 12,000*l.*, which was subsequently increased, on his marriage, to 27,000*l.* In 1802 he was sworn a privy councillor; and transferred, the next year, from the Hanoverian to the British service. After receiving the rank of General he was appointed Colonel-in-Chief of the King's German Legion—a force which was intended for the protection of Hanover; but such was the general feeling in favour of the French, that Count Walloden, who afterwards took the command of the forces, was obliged to surrender. In 1804 the Duke was appointed to the command of the Home-District, and the following year received the Colonelcy of the Coldstream Guards. In 1813 he was promoted to the rank of Field-Marshal, and appointed by his royal father governor-general of Hanover, which honourable post he continued to fill, with general satisfaction, until the death of William IV. in 1839, when he returned to England, in consequence of his elder brother, the Duke of Cumberland, succeeding to the kingdom of Hanover. In 1818 his royal highness was united in marriage to the Princess Wilhelmina Louisa, youngest daughter of Fredk. landgrave of Hesse-Cassell. After this, he was rewarded with many honourable distinctions. Among other appointments he was made Chief Ranger of Richmond Park, Hyde Park, and St. James's Park, and keeper of the New Forest; all of which offices he continued to hold to the time of his death. His royal highness was a kind and liberal supporter of most of our charitable institutions, many of which were honoured with his presidency or active patronage. His manners were pleasing and affable; and his private character in every respect unexceptionable. He was, in truth, a thorough English prince in his habits, feelings, and general pursuits, and possessed the confidence and respect of all with whom he was associated. He died at Cambridge House, in Piccadilly, in 1850, in the 77th year of his age.

CAMBRIDGE UNIVERSITY (iv. 67-9).

By an act of Parliament, passed in 1856, some important reforms have been effected in the government, discipline, and educational routine 'of the university of Cambridge, of the colleges therein, and of the College of King Henry the Sixth at Eton.' This act provides for the reform of the university, under the direction of certain commissioners, whose powers are to continue till January 1859, and if necessary to be extended to January 1860. These commissioners are vested with power to require the production of all documents, frame university statutes, &c.; and the government of the university is placed under the direction of a Council of the Senate, which consists of the chancellor and vice-chancellor, four heads of colleges, four professors of the university, and eight other members of the Senate. This act was founded on the report of the commission officially appointed by government to investigate the subject, and was laid before the public in 1852. That commission recommended the abolition of the exclusive jurisdiction of the university on personal pleas of debts, contracts, &c., and of many other customs which are not compatible with the existing state of society. In considering the whole field of the academical *curriculum*, the commissioners argued the expediency of constituting boards of studies in theology, in law, and in medicine, as well as in mathematics and classics; and of abandoning theological tests for any but theological degrees. There was also a suggestion for the endowment of a professorship of mediæval art in general, and of architecture in particular. It was also proposed to appoint a large number of public teachers, to be called Lecturers, who were to work under the professors. Upon the whole they recommended, under one general council, seven boards of studies, viz. theology, law, medicine, mathematics, classics, natural science, and moral science; with subsidiary branches of engineering and modern language studies. A general revision of the statutes of the colleges and the throwing open of King's College were also recommended. Finally, the commissioners recommended periodical visitations; and suggested that the best practical means of carrying their recommendations into effect, was laying down, by an act of legislature, the principles on which reform should be conducted. Accordingly the leading suggestions of the Commission were embodied in a special act of Parliament, passed in 1856, by which the university of Cambridge is now governed.

As to the college revenues the Commissioners received statements of income and expenditure from twelve out of the seventeen colleges, five having declined to furnish information. The gross incomes of these twelve colleges are as follow:—

	£	s.	d.
St. Peter's College	7,317	3	0
Pembroke „	12,013	8	0
Trinity Hall „	3,917	2	10
King's „	26,857	7	11
Queen's „	5,347	0	1
Christ's „	9,178	15	5
St. John's „	26,166	14	11
Magdalene „	4,130	0	0
Trinity „	34,521	19	10

	£	s.	d.
Emmanuel College	6,516	16	3
Sidney Sussex „	5,392	16	10
Downing „	7,239	17	0

The entire income of the seventeen colleges is estimated at not less than 185,000*l.* per annum.

CAMBRIDGESHIRE (iv. 70-72). According to the census of 1851, the entire population of the county was 185,405; of which 92,699 were males, and 92,706 females. Of houses, inhabited and uninhabited, there were 38,855. The population of the principal parishes and towns, exceeding 2000 inhabitants, was as follows:—

Cambridge ...	27,815	Linton	2,061
Chatteris ...	3,738	Littleport ...	2,832
Chesterton ...	2,816	March	4,171
Cottenham ...	2,314	Newmarket ...	3,356
Doddington ...	9,703	Soham	2,756
Downham ...	2,299	Thorney ...	2,174
Ely...	6,176	Upwell... ...	2,091
Haddenham ...	2,118	Whittlesey ...	5,472
Isleham... ...	2,236	Wisbeach ...	10,594

CAMDEN, JOHN JEFFREYS PRATT, MARQ. of. This distinguished statesman was born in 1759; and was the only son of Charles First Earl of Camden, some time Lord High Chancellor of England. He was educated at Cambridge; and in 1780 he was returned to Parliament as one of the members for Bath. He soon afterwards received the appointment of one of the tellers of the Exchequer. In 1795 he was made Lord-Lieutenant of Ireland, having, the previous year, succeeded to the peerage on the death of his father. For his distinguished political services, he was, in 1812, created Marquis Camden, and Earl of Brecknock. He died in 1840.

CAMELS' HAY, the *Andropogon Schœnanthus* of Linnæus, belonging to the natural order *Graminaceæ*, the grass tribe. It is said to be the only variety of grass, growing in the deserts between Syria and Egypt, which camels eat: the origin of the above name is therefore sufficiently obvious. It was formerly in the London Pharmacopœia, and termed *schœnanthus, squinanthus*, or *juncus odoratus*; its common name being squinanch, or sweet-smelling rush. It was imported from Turkey and Arabia in bundles, and used as a stimulant and deobstruent; but is now in little use. Its stem contains a pith, like the common rush, and resembles a barley straw; the flowers are carnation, coloured with purple streaks. It is said to be drunk in the form of an infusion, in India, by those with whom Chinese tea does not agree.

CAMEOS (iv. 80, 81). In a useful little work, entitled 'Novelties, Inventions, and Curiosities in Art,' &c., appears a description of a very interesting process called 'Cameo Incrustation.' It appears that about a century ago, the Bohemian glass manufacturers excited much interest by the production of bas-relief casts of medals and busts, inclosed within a coating of white flint glass. But as the English artists generally improve upon everything, a patent was soon taken out for an improved method of 'Cameo Incrustation.' The writer thus describes the improved process:—'To produce the desired result,' says he, 'the figure intended for incrustation must be

made of materials that require a higher degree of heat for their fusion than the glass within which it is to be encrusted; a mixture of china clay and silicate of potash is found to possess this quality. The bust or bas-relief is made of this material from a plaster mould, and, after being slightly baked, is cooled gradually. A mass of transparent white glass is blown hollow, with one end open, and the clay cameo, heated to redness, is placed within it. The mass is pressed or welded to make the two substances adhere, and the remote end being closed, the glass blower *draws out* the air from within (instead of forcing in air as in the ordinary manufacture), thus causing the glass to collapse, and to form one continuous substance with the cameo. When the glass is cut and polished, to any desired form, the effect produced is striking and beautiful, for the clay cameo or bust has the appearance of unburnished silver, isolated in the midst of the solid transparent glass. Small articles are incrusted in a more expeditious manner, especially upon glass goblets or similar hollow vessels. The hot cameo is placed upon the hot manufactured vessel, a small piece of semi-liquid glass is dropped upon it, and this both fixes the cameo in its place, and forms a glassy layer to enclose it.'

CAMLET (French, *camelot*), a light stuff made of long wool, hard spun, and sometimes mixed with linen yarn or cotton. It was originally a rough fabric, made of the hair of the camel and the goat interwoven, and in the east it was made of the hair of the Angora goat.

CAMPBELL, GENERAL SIR H. F., K.C.B., G.C.H. (Colonel of the 25th regiment), was born in 1770, and entered the army in 1786. In 1793 and 1794, he served in Holland and Flanders. Having risen to the rank of colonel he proceeded to the Peninsula in command of the second brigade of Guards, and was present at the passage of the Douro, capture of Oporto, and action at Salamanca. A severe wound he received at Talavera compelled him to return to England. In 1811, however, he rejoined the army as major-general, and again commanded the Guards at the siege of Ciudad-Rodrigo. Shortly afterwards, succeeding to the command of the 1st division, he accompanied the army in its advance into Spain, and was present at the battle of Salamanca, capture of Madrid, and siege of Burgos, for which services he was made a K.C.B. He died in 1857.

CAMPBELL, THOMAS, the distinguished poet and author of the 'Pleasures of Hope,' was born at Glasgow in 1777. His father was a retired merchant, of an old Highland family, who conferred on the son of his old age a most excellent education at Glasgow college. It is said, however, that Thomas was but an idle schoolboy in his early years; but that his talents suddenly developed themselves, about the age of thirteen, when he carried off a bursary, from a competitor twice his own age, and won a prize for a first-rate translation of the 'Clouds' of Aristophanes. Leaving Glasgow at an early age, he settled at Edinburgh, where he devoted himself to private tuition; and when only in his twenty-second year, produced his 'Pleasures of Hope,' a work generally admitted to be one of the most elegant poems in our language. Its success, and the profits of the sale, enabled our young poet to make the tour of the Continent; the results of which were some of the finest lyrics of modern times. 'Ye Mariners of England,' was written at Hamburgh, when a Dutch war was in prospective. 'The Exile of Erin,' originated from the circumstance of young Campbell's casual encounter with some of the banished Irish rebels of that period. His poem of 'Hohenlinden' was penned, it may be presumed, from his own personal observations and impressions. At the battle of Hohenlinden he was so near the scene of action that he could see the conquerors wiping their blood-stained swords on the manes of their horses—a circumstance to which, in after years, he was heard frequently to allude. On his return from the Continent, after visiting Edinburgh, he came to London, and married his cousin Miss Matilda Sinclair. Here he settled down to the usual routine of literature, and amongst his other labours produced an historical work, entitled, 'Annals of Great Britain, from the Accession of George III. to the Peace of Amiens,' which was published in 1807. About this time, the Prime Minister Charles Fox placed him on the pension list at 200*l.* per annum. The liberal principles which Campbell evinced in conversation, and in his writings generally, were probably the chief cause of this ministerial boon. After devoting some years to literary labour, he produced, in 1809, his 'Gertrude of Wyoming,' 'Lord Ullin's Daughter,' 'The Battle of the Baltic,' and 'O'Connor's Child.' He was shortly afterwards, in consequence of the favourable reception of a series of lectures, which he had delivered at the Royal Institution, engaged by Mr. Murray, to write the well-known work, 'Critical Essays and Specimens,' consisting of seven volumes, which may be said to have established his fame as a prose writer.

In 1820 Mr. Campbell was engaged by Mr. Colburn to edit the 'New Monthly Magazine,' which was under his management for ten years. In 1824 he produced a long but feebly-written poem under the name of 'Theodoric.' At this period his name was associated with various matters of public interest. He was mainly instrumental in the establishment of the London University, and deeply interested himself in the cause of Greece and of Poland. At the same time the University of Glasgow evinced so strong a feeling in his favour, as to elect him to the dignified position of Lord Rector, a distinction of which he was always proud.

After relinquishing the editorship of the 'New Monthly Magazine,' Mr. Campbell undertook to re-establish, in 1831, the 'Metropolitan Magazine,' for which purpose Samuel Rogers, the poet, advanced him 500*l.*; but his health and energies having at this time materially declined, the publication was not prosperous; and he soon relinquished the undertaking. In 1832 he paid a visit to Algiers, where he composed several interesting letters, which were published in England. He also brought out the 'Life of Mrs. Siddons,' 'Letters from the South,' and the 'Life of Petrarch;'

yet his health and his intellectual energies, year after year, were gradually on the wane; and his writings appeared to have lost their wonted vigour. In 1842 he again visited Germany; and on his return to England resided with his niece in Victoria Square, Pimlico; but his health continuing to decline he retired, in 1843, to Boulogne. The last poem which he wrote, 'The Pilgrim of Glencoe,' was dedicated to his old and intimate friend, Dr. Beattie, who was unremitting in his medical attentions to the last hour of the poet's existence. He died at Boulogne, in June 1844.

CAMPHENE, the pure oil of turpentine, rectified; and sold in the shops for illuminating purposes. Ordinary oil of turpentine contains a portion of resin formed by exposure to the air, and this renders it unfit for the purposes of illumination. It is therefore subjected to re-distillation with carbonate of potash, or some similar agent, which deprives it of its resin. When quite pure, oil of turpentine is a hydrocarbon, the composition of which is C_{20} H_{16}; but in the ordinary or impure state it contains oxygen also.

Camphene was formerly used, to some extent, for the purposes of illumination; but it was not altogether unobjectionable as an illuminating agent, owing to the danger attendant on its use, and the annoyance caused by the dense soot formed by its too rapid combustion. It has now been gradually superseded by the introduction of the moderateur lamps.

CAMPHOR, ARTIFICIAL, is a white crystalline solid, very much resembling true camphor in appearance. It is obtained by passing dry hydrochloric acid gas through oil of turpentine, in a vessel surrounded by ice. Two products are the result of this process; the one solid, which is the camphor, and the other liquid, to which the term *liquid Artificial Camphor, terebene*, or *terebylene*, has been applied.

The solid camphor has a camphoraceous taste and odour. Its composition is C_{20} H_{16}, H Cl. It is volatile, but not without a little decomposition, hydrochloric acid being formed. When distilled with lime it yields chloride of calcium, water, and a volatile oil called *Camphilene*. The French oil of turpentine is said to yield the most camphor.

CAMPHRONE, an oily liquid obtained by passing the vapour of camphor over red hot lime.

CAMP-VINEGAR, a preparation of vinegar and Cayenne pepper, viz. walnut ketchup, chopped anchovies, and a fine clove of garlic, finely minced, strained, and bottled.

CAMPYLOPTERUS (Gr. *κάμπυλον* and *πτερὸν* a bent wing), a genus of birds, of the family Trochilidæ, or humming-birds.

CANADA (iv. 100-110). Since the settlement of the disputes with the mother country, and the general absence of popular agitation, both the Canadas have made amazing progress in commercial enterprise and general prosperity. By the formation of agricultural societies, and the emigration of scientific agriculturists, a wonderful change has taken place. The abandoned fields have been reclaimed, and a better kind of stock introduced. Imports and exports have also kept pace with agricultural progress. In 1849, 1248 vessels, of an aggregate tonnage of 500,200 tons, arrived. In 1850 the imports were estimated at 2,245,517*l.*; the exports of domestic produce amounted to 2,669,998*l.*; and the customs duties to 615,694*l.* It was in 1850 that Lord John Russell, when introducing a general measure for improving the government of the British colonies, presented an outline of the increasing population and progressive prosperity of the Canadas. He stated that the population of Lower Canada, in 1844, was 690,782, which was an increase of thirty-five per cent. in thirteen years; while in 1848 the population was 770,000, being an increase equal to 12 per cent. in four years. Taking Upper and Lower Canada together, the increase from 1825 to 1831, a period of six years, was 29 per cent. In 1843, the increase was 55 per cent. In 1848, being four years, it was 28 per cent. The increase in commerce, within the last few years, had been no less remarkable. In 1835 the imports were estimated at 2,730,000*l.*; in 1846, 4,032,000*l.* The exports in 1835 were 1,929,000*l.*; in 1846, 3,201,000*l.* The shipping inwards increased from 1,077,000*l.* to 1,461,000*l.*, whilst the shipping outwards increased from 1,065,000*l.*, to 1,494,000*l.* The property assessed to the local taxation was, in 1825, 2,256,000*l.*, and in 1830 their value was 2,920,000*l.*; in 1835, 3,880,000*l.*; in 1840, 5,607,000*l.*; in 1845, 7,778,000*l.*; and in 1847, 8,567,000*l.* In 1851, the entire population amounted to 890,261 for East Canada, and 952,004 for West Canada. The number of schools for East Canada, in 1851, was 2005; and the scholars in attendance were 79,248. In 1852 there were, in West Canada, 8 colleges, with 721 students; a normal and a model school, containing 245 students; 98 grammar schools, with 3194 students, and 3010 common schools, with 179,587 pupils; thus making a total of 3285 scholastic establishments in operation, with an aggregate of 188,910 students. Numerous railways are also in progress; and some excellent roads and canals have been formed in the interior. As there is no stamp on newspapers, and no duty on paper or advertisements, the press is making rapid advances. There are 30 newspapers in West, and 20 in East Canada, some of which are published daily. On the whole there is every inducement for the emigrant. Land is sold at from 2*s.* to 24*s.* per acre, and the wages of agricultural labourers are high. In 1851 the sum of 15,515*l.* was remitted by emigrants to their friends in Europe, to enable them to reach Canada.

A recent letter from Mr. James Barton, an English emigrant who is settled as a farmer near London in Canada West, informs us that 'the only great want is labourers; for wages are so high that no prudent man remains a labourer long, as he soon accumulates sufficient to enable him to take a farm on his own account, and government sells land to approved persons at 10*s.* per acre, payable by instalments.' He says he would ensure fifty farm labourers 10*s.* to 12*s.* per week for the first year, in addition to food and lodging; and that it would be their own fault if they did not get higher wages afterwards. 'The progress

of civilization,' he observes, 'has been wonderful, and that which was once an impenetrable forest has been transformed into fruitful fields. As to her laws, they are equal to those of England. The colony is governed by a Parliament which originates the laws; only they must be approved by the Upper House and the Governor General. The land is divided into townships, each comprising from 50,000 to 80,000 acres. The townships are divided into wards, each of which elect a councilman on the first Monday in every year. The council thus elected appoint officers, such as way-wardens, pound-keepers, &c. The schools of the townships are each governed by three trustees, who appoint a teacher, and pay him out of the taxes collected for general purposes within the township.'

As to the future prospects of Canada, they are evidently of the most favourable character. In 1785, as it was lately stated by Ex-Judge Haliburton, at the Manchester Athenæum, there were only 3,000,000 of inhabitants in the United States, and in Canada there were now the same number; while the secret was becoming known that it was an infinitely finer country than any portion of the United States; and in ten years more we might expect the population of Canada to be 20,000,000.

CANALS (iv. 10). The plan of cutting a canal through the Isthmus of Suez, for the purpose of uniting the Red Sea and the Mediterranean, which has been in contemplation for the last century, is neither a novel nor an impracticable project. The Greek historians have recorded that it was projected and begun by Sesostris, King of Egypt, or, as others say, by Psammetichus. Necho, his successor, employed a vast number of men upon the undertaking, and spent immense sums of money; but being terrified by the oracle, which told him that he would open an inroad to the barbarians, or foreigners, he suddenly relinquished the task. The work was afterwards resumed by Darius, the Persian conqueror; but he also desisted, on being told that as the Red Sea lay higher than Egypt it would drown the whole country. It was at last, however, completed by the Ptolemies, who, by the aid of sluices, opened or shut the canal, as occasion required. It began near the city of Bubastus, not far from the Delta, and was of great service to the trade of Egypt. It is described as being fifty yards wide, and about 150 miles long. It was thus wide enough to admit of two vessels passing with ease, and deep enough to float the largest ships. But in the course of ages it became choked up with the sands of the desert, and scarcely any remains of it are now to be found. (Herod. l. ii. c. 158; Strabo; and Pliny.)

Such is the history of the celebrated canal for uniting the Red Sea and the Mediterranean; but, with all its difficulties, it can scarcely be compared to the one which is now in contemplation for effecting a junction between the Atlantic and the Pacific Oceans, across the Isthmus of Panama; for which three distinct routes are laid down, under the head of Central America, to which the reader is referred. [AMERICA, CENTRAL, *Supp.*]

CANA'LIS (Lat. *canna* a reed or cane), a term of frequent use in anatomy, applied to the different arteries or blood-vessels, which act as *canals* in the circulation of the blood. Thus the *Canalis arteriosus* is an arterial vessel which unites the aorta and the pulmonary artery in the fœtus. The *C. venosus* is a venous canal, which carries the blood from the vena portæ of the liver to the ascending vena cava; and the *C. petitianus* is a triangular cavity formed by the separation of the anterior lamina of the crystalline lens from the posterior. (Craig.)

CANA'RIUM, a genus of Terebinthaceous Exogens, natives of the Indian islands. A resin closely resembling elemi is yielded by the *Canarium balsamiferum*. The *C. commune* is thought by some to be the source of East Indian elemi; the fruit is a nut, which is eatable, and may be made into bread, but when eaten raw is said to occasion diarrhœa. The nuts are called *Java Almonds*, and the kernels yield an oil. An abundance of limpid oil, with a pungent terebinthaceous odour, is yielded by the bark; this congeals into a buttery substance resembling camphor, which is said to have similar properties to Balsam of Copaiba.

CANCELLA'RIA (Lat. *cancillatus* cross-barred), in conchology, a genus of univalves, of the subfamily Scolyminæ, according to Swainson; the shell is turbinate, scabrous, and reticulated, and the body ventricose.

CANCIL'LA (Lat. *cancillatus* latticed-wise), a genus of univalve testacea, belonging to the family Volutinæ (volutes), and sub-family Mitranæ; the spire and aperture are nearly of equal length; the whorls crossed by transverse lineal ribs, reticulated transversely with bands and striæ.

CANDLE, MERCURIAL, used for the purpose of fumigation. These candles are prepared by adding cinnabar or sub-oxide of mercury to melted wax, and burning by means of a wick.

CANE, INDIAN, the *Canna Indica*, a plant belonging to the natural order Marantaceæ of Lindley, and the Cannaceæ of other authorities. The starchy substance, known in commerce under the name of *tous le mois*, is the product of one or other species of this genus. It is probable, however, that more than one species is confounded under the same name in different localities. There appears to be good evidence in favour of its being produced by the *C. edulis*.

The seeds of the C. Indica, together with those of other species, are said to be sometimes used as shot in India, and are denominated Indian shot.

CANIC'ULAR DAYS (Lat. *canis* a dog), a certain number of midsummer days, which precede and follow the heliacal rising of the *Canicula*, or Dog-star; whence they are commonly called the Dog-days, and are usually the days of the greatest summer heat. Among the Egyptians, who were the first people known to have devoted themselves to astronomical sciences, the *Canicular* or natural year was computed from one heliacal rising of the Canicula to another.

CANINO, CHAS. BONAPARTE, PRINCE OF, eldest son of Prince Lucien Bonaparte, and cousin to the reigning emperor of the French, was

born at Paris in 1803. He was distinguished for his literary taste and his extensive knowledge of the fine arts. He was connected with most of the academies and learned societies of Europe. He was also an author of some repute in the departments of scientific literature. His works on natural history, and more especially on the 'Zoology of Europe,' and the 'Ornithology of America,' are still held in great estimation. In the year 1848 the Prince was elected President of the Roman Constituent Assembly; but, with the exception of that short period, he interfered very little with the politics of Europe. He died in 1857.

CANNABINE, the chemical name of a substance which is considered to be the active principle of the Indian hemp. [CANNABIS, iv. 132.] It is a soft resin, soluble in ether and alcohol, and, on the addition of water, is thrown down from the latter solution in the form of a white precipitate. It has a bitterish, acrid taste, and a fragrant odour, especially when heated, and possesses very powerful and singularly intoxicating properties.

The Indian hemp has been described by some botanists under the name of '*Cannabis Indica*;' but as it appears to present no specific differences from the common hemp, it is now generally considered by most distinguished botanists to be merely a variety of the *Cannabis sativa* (termed *Cannabis sativa*, variety *Indica*), in contradistinction to the common hemp plant. The plant belongs to the natural order *Cannabinaceæ*, Hemp-worts, of Lindley, and to the class *Dioecia*, order *Pentandria*, of the Linnæan system. The European variety is nearly or entirely destitute of the resinous secretion, on which the narcotic properties of the plant depend; but in warm countries, and in certain seasons, it is secreted abundantly on the leaves and slender stems and flowers, and their concretes. Dr. O'Shaunessy, to whom we are indebted for many particulars concerning this plant, says, it is collected in the following singular manner:—'Men clad in leathern dresses run through the hemp fields, brushing through the plant with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off and kneaded into balls, when it is called *Churrus*.' A still finer kind, the *Momeea*, or waxen churrus, is collected by the hand, in Nipal, and sells for nearly double the price of the ordinary kind. Churrus is stated to be also collected by other processes. This resin is the basis of all the preparations, and to it are all the powers of the drug attributable.

The hemp plant, when dried after flowering, without the resin being removed, is termed *Gungah*. It is chiefly used for smoking. The effects produced are heaviness, laziness, and agreeable reveries, from which, however, the person can be readily roused. Four or five persons generally join each other, and the hookah is passed round to each in succession. Intoxication soon ensues from one draught with those unaccustomed to it, and from four or five to those who are more practised.

Another variety of the drug is that termed '*Bang*, *Subjee*, or *Sidhee*,' and is composed of the capsules of the plants deprived of the stalks and the larger leaves. It is cheaper than gunjab, and less powerful. It is used for making an intoxicating drink, for smoking, and in the manufacture of a confection termed *Majoon*, which is a compound of butter, sugar, milk, flour, and bang. The inebriation caused by this drink is mostly of a cheerful kind, causing the person to dance and sing, and to evince a great relish for food. In persons of a quarrelsome disposition it developes their natural temper. It differs from most other intoxicating agents in causing no nausea or sickness of stomach, the only inconvenience experienced being that of a slight giddiness perceptible the next day. The effects produced by this confection is described by Ameer, as being most fascinating; causing a state of ecstatic happiness, the sensation of flying, a voracious appetite, and the persuasion of high rank.

Dr. O'Shaunessy's experiments on animals led to the following results:—'That carnivorous animals and fish were speedily and invariably intoxicated by the drug; whilst the graminivorous experienced but trivial effects from any dose that he administered; and in no case did he observe any indication of pain or convulsive movement. He made a trial of its effects in several cases of human suffering. In one of hydrophobia, although it materially divested the disease of many of its horrors, and afforded great alleviation of the sufferings, it failed to effect a cure. In a case of epidemic cholera, however, he was more successful, and effected a cure by the agency of this drug in the course of a day. He states, however, that the epidemic was not malignant at the time. He employed it also with success in tetanus and delirium tremens, also in cases of rheumatism. During the trial of the effects of the drug on the human system he was a witness to a remarkable state of catalepsy, on more than one occasion. During the fit, the legs and arms of the patient were placed in every imaginable attitude, and remained in the position in which they were placed, however contrary to the natural influence of gravity. At the same time they were as pliant as possible. An incautious use of the drug, he says, produces a peculiar form of insanity, at once recognizable by the strange balancing gait of the patient, a constant rubbing of the hands, perpetual giggling, and a propensity to caress and chafe the feet of all bystanders, of whatever rank. The eye wears an expression of cunning and merriment, which can scarcely be mistaken. In a few cases the patients are violent, and in all instances voracious by hunger. Under medical treatment, however, the symptoms have been rapidly dispelled, and the patient has been restored to perfect health.'

It is considered by Nees and Esenbeck that the *Nepenthe* of the ancients was a preparation from the leaves of this plant. The seeds of the plant are oleaginous, and destitute of the narcotic quality. They are employed for feeding cage birds, and are stated by Burnett to possess the singular property of changing the colour of the plumage of bullfinches and goldfinches, from red and yellow to

black, if the birds are fed on the seeds for too long a time, or in too large a quantity. Preparations of the plant are termed *Hashish* by the Arabians, *Malach* by the Turks, and *Ducha* by the Hottentots. It is also designated *Tobacco of the Congou* by the Negroes of the Kongo and Angola.

The plant has been used in the South of Africa, South America, Turkey, Egypt, Asia Minor, India, &c., as a popular medicine, and employed for various affections, and also as a ready agent of a pleasing intoxication. In Europe its use, as a stimulant or remedy, until recently was but little known. Dr. Pereira made experiments in this country, to some of which Dr. O'Shaunessy was a witness; but he failed in obtaining any results, probably owing to some changes having taken place in the drug. Dr. O'S. found, when in England, that he was obliged to give as much as 10 or 12 grains, or even more, at a dose, though in India he considered ½ grain sufficient, and 1½ grain a large dose. It has been used by Hahnemun in the form of wine.

CANNABINA'CEÆ (Hempworts), a natural order of monochlamydeous exogens, formerly included with the nettles (*Urticaceæ*), but now arranged by Lindley as a separate order. The Hop, *Humulus lupulus*, and Hemp, *Cannabis sativa*, are comprised in it.

CANNEL COAL (from *candle*, owing to the blazing light it emits when burning), a solid, bituminous, jet-black, and smooth-surfaced fossil, very hard, not fusible, but easily inflammable, and burning rapidly with a bright blaze. It is very brittle, and breaks with a conchoidal fracture. It is chiefly the production of Lancashire and Scotland, where it is termed *parrot coal*. It is susceptible of a fine black polish, and, like jet, can be worked into trinkets and ornaments. Indeed the difference between cannel coal and jet appears to consist in the presence or absence of foreign earthy matters. Thus, when their presence is considerable, and the mass is specifically heavier than water, and does not readily manifest electric properties, it is with propriety termed cannel coal; but when these earthy matters are absent, or only exist in small proportions, the bituminous mass is sufficiently light to float on water, and then the term jet is properly applied. (Craig.)

CANTERBURY, CHARLES MANNERS SUTTON, LORD VISCOUNT, many years Speaker of the House of Commons. He was the great grandson of the third duke of Rutland, and grandson of Lord George Manners, who assumed the additional surname of Sutton, from having inherited the estates of the Suttons, Lords Lexington. He was born in 1780; and was educated at Eton. Being destined for the law, he entered as a student at Lincoln's Inn, and in 1805 was called to the bar. He first sat in Parliament for Scarborough, in the year 1807; and at the first general election, under the Reform Act in 1832, he was selected for the Univerity of Cambridge. In 1809 he was appointed to the office of Judge-Advocate General; and on Mr. Abbot (afterwards Lord Colchester) retiring from the speakership of the House of Commons, in 1817, the great abilities and high character of Mr. Manners Sutton recommended him to the attention of the House, and he was elected to the distinguished situation of Speaker, the duties of which he fulfilled with great talent and impartiality for many years. He commanded not only the esteem of the House generally, but the respect of his political opponents in particular. So high an opinion had King William of his services and character, that in 1832 he invested him with the order of the Bath. In the latter end of the year 1834, it was generally rumoured that Mr. Sutton had taken an active part in the formation of the Peel ministry; on which the friends and adherents of Lord Melbourne put Mr. Abercrombie in nomination as Speaker of the House of Commons, and he was chosen by a majority of ten. Shortly after this, Mr. Sutton was called to the Upper House by the titles of Viscount Canterbury and Baron Bottesford, by patent dated 1835. He was soon afterwards selected to fill the important office of High Commissioner for adjusting the claims of Canada, although he never entered upon the duties of the situation. He died in 1845.

CANTHAPLEU'RA (Gr. ἄκανθα a prickle, and πλευρὰ the side), a genus of the Cyclobranchia, or Chitons, in which the mantle is prickly with moveable spines; the plates of the shell being the same as in the Chitons.

CANTHEDER'MIS (Gr. ἄκανθα a prickle, and δέρμα the skin), a genus of fishes, of the order Plectognathes, whose bodies are covered over with minute spines or prickles, as the word indicates.

There are also many genera of prickle-bodied fishes and Testacea, which have received their names from the word *acantha*, with slight cognominal variations; as *Cantherhinus* (prickle-snouted), a genus of cheliform fishes; *Canthidomus* (prickle-domed), a sub-genus of turbinated univalves; *Canthigaster* (prickle-bellied), a genus of cheliform fishes, of the order Plectognathes; *Canthilepies* (minutely-prickled); *Canthirhynchus* (prickle-snouted), a genus of fish of the family Agonidæ; *Canthophrys* (prickle-eyebrowed), a genus of the family Cobitidæ; *Canthorbis* (prickle-orbed), a genus of shells belonging to the Trochinæ, or Tops.

CAOUTCHOUCINE (sometimes called *Caoutchoucisin*), is a highly volatile liquid, obtained by submitting caoutchouc to dry distillation. It is very inflammable, and applicable to many useful purposes in the arts. When mixed with spirit it acts as a good solvent of caoutchouc, and of some resinous substances that are difficult of solubility.

CAPE GUM. This term is given in commercial language to an inferior kind of Gum Acacia. It is said to be the produce of the *Acacia horrida*, a large tree, a native of the Cape Colony. Some think it to be the produce of a tree termed *A. Capensis*. Both species belong to the natural order *Fabaceæ* of Lindley.

CAPER SPURGE, the *Euphorbia Lathyris*, belonging to the order *Euphorbiaceæ*. The capsules of this plant are frequently pickled by the cottagers in the country, and used as a substitute

for capers; but the practice is a dangerous one, for the plant possesses a most active poisonous juice; and although this acrid principle may be modified or destroyed by the process of pickling, it is by no means safe as an article of dietetic use. The seeds of the plant yield a fine oil. One seed is said to be sufficient to occasion purging. The leaves are stated to be inebriating to fish, and the juice of the plant is a popular remedy for the corrosion of warts.

CAPITE CENSI, among the ancient Romans, a term applied to the lowest rank of citizens. Thus, among the different tribes enumerated at the general census, the *Proletarii* were those whose fortunes were below a certain valuation; while those who had no fortune at all were classed in the *Capite Censi*. These made part of the sixth class of Roman citizens, and were thus denominated because they were enumerated rather by their heads than by their estates. In the general taxation they were rated the lowest of all; and being considered as incapable of bearing the expenses of war, they were not, before the time of C. Marius, enrolled in the army. (Adam's *Roman Antiq.*)

CAPSULES, MEDICINAL, small vessels or cells of an egg-like shape, used to enclose medicines of a nauseous character. They are usually made of gelatine, mixed with a little sugar, and obtained of the required shape by means of a mould. A patent has been taken out for manufacturing them from organic membranes. Some French pharmaciens form them from the gluten of oat flour.

CARAVAN'SERA (iv. 184), a large and commodious building or general hostelrie, established in various countries of the East, for the purpose of accommodating the body of merchants and pilgrims who travel with the caravans on the public roads. It is usually a large square building, in the centre of which there is a very spacious court. Beneath the piazzas or arches which support it, there runs a sort of bank, or embankment, raised some feet above the ground, where the travellers of every grade take up their lodgings; the beasts of burden which carry the merchandize and luggage being tied to the foot of the bank.

CAR'AMEL, a chemical term applied to burnt sugar. The sugar is subjected to heat, until it assumes a dark brown colour; it is then dissolved in water, and used for the purpose of colouring spirits, &c., especially brandy.

CAR'APA, a genus of the natural order *Meliaceæ*. A bitter oil, called Oil of Carapa, is extracted from the fruit of the *Carapa Guianensis*. It is used internally as an anthelmintic, and externally is applied to the skin, and also to the hair, to promote its growth. This oil is said to possess the singular property of preserving iron from rust. The bark of the root of *C. obovata* is bitter and astringent. The *C. Moluccensis*, a native of various parts of the East Indies, possesses an extremely bitter principle, and from the fruit of the *C. Touloucouna*, a native of Affica, a concrete fixed oil is extracted, called *Tallicoonah*, or *Kunda* oil. It is used as an anthelmintic and purgative by the natives. It is acrid and bitter to the taste, and said to be well suited for burning in lamps. It is sometimes also used as an application to the skin.

CARBO-CERINE, the carbonate of cerium, a mineral of great scarcity, which occurs in thin four-sided crystalline plates of a greyish-white colour. Its component parts are 75·7 of oxide of cerium, 10·8 of carbonic acid, and 13·5 of water.

CARBO-SULPHURIC ACID (sometimes termed *Hydroxanthic Acid*), is obtained by treating an alcoholic solution of pure potassa with bi-sulphuret of carbon, and evaporating the resulting compound under the exhausted receiver of the air pump over sulphuric acid; or by exposing to a temperature of 32°, crystals are formed of an acicular slope, which by exposure to the air become yellow. From these crystals the acid may be obtained by decomposing the salt with diluted sulphuric or hydrochloric acid, when it is set free as an oily fluid which is heavier than water. It possesses a sour, bitter, and astringent taste, reddens litmus, and is inflammable. When heated to 212° it suffers decomposition; an inflammable gas being evolved, and bisulphuret of carbon formed.

CARBUNCLE, in mineralogy, a variety of garnet, of a deep red colour, with an admixture of scarlet. It was a gem highly appreciated by the ancients, and is frequently mentioned in the Holy Scriptures. In surgery the term is applied to inflammatory tumours nearly allied to a boil, but more aggravated and dangerous in all their symptoms.

CARBURETTED HYDROGEN, an invisible elastic gas, consisting of carbon dissolved in hydrogen, of a very inflammable nature, and commonly known among miners by the name of fire-damp. It is frequently found issuing in large quantities from fissures in coal beds, where it often explodes when coming in contact with the miner's lamp; and the most destructive consequences to human life sometimes ensue. What renders this gas so extremely dangerous in mines, is the circumstance that whenever the atmosphere of a mine becomes charged with more than one-thirteenth of its volume of carburetted hydrogen gas, the whole becomes explosive. Sir H. Davy's safety lamp, however, has been the means of lessening the number of these melancholy accidents.

In warm weather this gas is found at the bottom of stagnant waters, and may readily be collected at their surface by suspending a bottle of water over the pool, similar to the decanting of gases over a pneumatic trough, and stirring up the mud to disengage the carburretted hydrogen.

The proportions of carbon and hydrogen, in the production of this gas, vary according to the processes by which it is obtained. In its purest form, its specific gravity is to that of hydrogen gas as rather less than 9 to 1. In bulk 100 cubic inches weigh about 20 grains. This gas, as procured from pit-coal, is now extensively and very advantageously employed for lighting the public streets, manufactories, and private houses. In its manufacture one pound of coal yields about 24 gallons of this inflammable gas, and the

remainder serves for fuel in the shape of coke. [Gas.]

CAR'DIAC (Gr. καρδία the heart), in anatomy a term applied to the blood-vessels, nerves, &c. of the heart, and also to the nerves which originate from the cervical ganglia, and unite to form, between the arch of the aorta and the bifurcation of the bronchia, the cardiac plexus. In pathology the term is applied to a painful affection of the heart.

CARDIGANSHIRE, in Wales (iv. 192-3). According to the census of 1851 the population of the county was 70,796; and the number of inhabited houses 14,978. The population of the principal places was as follows:—

Aberystwith, bor.	5231	Lampeter.....	1488
Cardigan	3876	——— .. bor.	907

CAR'DITA, a genus of bivalve Mollusca, of the family Chamidæ, with a cardiform, sub-transverse, and ribbed shell.

CAR'DIUM (the cockle), a genus of univalve Mollusca, with a ventricose, heart-shaped shell, and costated ribs.

CARDO'NA, a small town of Catalonia, in Spain, celebrated for its inexhaustible mountain of red and white salt. This mountain is about three miles in circumference, and above 400 feet high. When cleared of extraneous matter the mineral appears as transparent as crystal, and is so hard and compact, that it will remain indissoluble in water. From it are made a great variety of vases, urns, candlesticks, and other utensils. The heaviest rains appear not to diminish this singular mountain, which, from the sharp forms of the rock, and the red and white hues of the saline particles, vividly contrasts with the grey and sombre tints of the surrounding mountains. Count Laborde, in his 'Travels in Spain,' has vividly described what he considers a wonderful phenomenon in physical geography. 'The mountain (says he) is intersected by crevices and chasms, with spacious grottoes, where are found stalactites of salt, shaped like bunches of grapes, and of various colours. Nothing (he continues) can compare with the magnificence of the spectacle which the mountain of Cardona exhibits at sunrise.' Besides the beautiful forms which it presents, it appears to rise above the river like a mountain of precious gems, displaying the various colours produced by the reflection of the solar rays through a prism. (M. Cordier's *Annales des Mines.*)

CARINE'A, in conchology, a genus of the Cypræidæ or Cowry family, with an oblong shell, aperture nearly straight, and almost central.

CARINI'DEA (Lat. *carina* a keel, and Gr. εἶδος resemblance), a genus of univalve Mollusca, belonging to the Trochidæ, or Top shells.

CARLOW, County of, in Ireland (iv. 202-3). According to the census of 1851, the population of the county was 68,075. The population of the principal towns was as follows:—

Carlow	9,901	Tullow .. pa.	4,478
——— .. bor.	10,955	——— .. t.	3,097

CARLUDOV'ICA, a genus of the natural order *Pandanaceæ*, or Screwpines. From the unexpanded leaves of the *Carludovica palmata*, the celebrated Panama hats are manufactured. These hats are exceedingly light and flexible, can be doubled up, and carried in the pocket without sustaining any damage, and are readily cleaned. They are formed of a single piece only, and are much in vogue all over the West Indies and the American continent, and would doubtless be much used in Europe, were it not for their high price. In the Isthmus of Panama the plant is called *Jipijapa* and *Portorico*. It is found in various places along the coast.

CARMARTHEN. [Caermarthen, *Suppl.*]

CAR'MELITES, a mendicant order of white friars, so called from Mount Carmel, whence they are said to have taken their rise. Their dress consists of a scapulary, or small brown habit, thrown over their shoulders. They are most numerous in Italy and Spain.

CAR'NARVON. [Caernarvon, *Suppl.*]

CAR'NIFEX, the public executioner at Rome, who put to death slaves and persons of the lowest rank; for slaves were punished in a manner different from free-born citizens. The carnifex was of a servile condition; and held in such general contempt, that he was forbidden to reside within the city, but lived without the Porta Metia, or Esquilina, where crosses and gibbets were erected, and where also the bodies of slaves were burnt or cast out unburied. (Adam.)

CARNO'SI (Lat. *carnis* of flesh), an order of Polypi, consisting of the Actinia, the Lucernalia, and the Zoanthus. They are flesh animals, as the name implies, and some of them have the power of crawling by their base, and swimming with the current, after having detached themselves from the places where they were first fixed. (Craig.)

CAROT'IDS, in anatomy, the name of the important artery situated on each side of the neck. These ascend on the fore part of the cervical vertebræ to the head, for the purpose of supplying it with blood. The right common carotid is given off from the arteria innominata, and the left arises from the arch of the aorta.

CARPEN'TUM, a richly-ornamented carriage among the Romans for carrying persons of consequence. The *Carpentum pompaticum* was a state carriage, in which the images of the deceased empresses were conveyed to the circus.

CARRA'RA WATER, an aërated water, for the manufacture of which a patent has been secured. It consists of carbonate of lime held in solution by an excess of carbonic acid gas; the gas is condensed into lime water, and the carbonate of lime first formed is re-dissolved. It is used in calculous complaints.

CARRIAGES, or CHARIOTS (iv. 414), are mentioned or described by almost every historian or poet of classical antiquity; and representations of various kinds, so far as to enable us to judge of their peculiarities and shapes, have been transmitted to our times by the ancient painters and sculptors. From Pliny we learn that four-wheeled carriages were invented by the Phrygians. The chariots of Homer's heroes are represented as shell-formed, and very low; and a charioteer, standing erect, guided the

horses with reins. Those of the Greeks and Etruscans were box-shaped; the four spokes of the wheel being in the form of a cross patée; and they sometimes appear with wings at the axle, to denote swiftness. The race-chariots were shell-formed, with two wheels, and the horses two, three, or four abreast. Among the Romans there were various sorts of carriages, to which distinct names were applied, and which are frequently mentioned by historians; as the *Basterna*, the *Biga*, the *Carpentum*, the *Carruca*, the *Rheda*, &c.; but the *Currus*, or Chariot, is the most celebrated. It had only two wheels, but was drawn by two, three, four, or even six horses abreast, and was remarkable for its velocity.

The Romans had also four-wheeled carriages, drawn by four horses; called *Thensa*, which were splendidly ornamented, and used for carrying the images of the gods in solemn procession. There were various-shaped carriages of basket work, which travelled very expeditiously, and were usually drawn by three mules abreast. In agricultural work they used the *Plaustrum*, or waggon, usually with two wheels, but sometimes with four, and adapted for carrying heavy burdens. On the decline of the empire four-wheeled carriages came generally into fashion.

Those carriages, commonly called COACHES, were unknown in England at the time of Henry VIII. It appears that the first coach used here was built in 1565 by Walter, Earl of Ripon; but their general clumsiness prevented their being much used. In the middle of the seventeenth century STAGE coaches were established; but in 1672 there were only six in the kingdom constantly running; and at that time pamphlets were written for their suppression, on account of their alleged demoralizing tendency. At the beginning of the present century, however, stage coaches came into extensive use in every part of the United Kingdom, until the Railways came into operation, when they were driven off all the main roads, and ceased to be the medium of public travelling. For two centuries, HACKNEY coaches, drawn by two horses, had been in general use for short journeys; but in all the large towns, especially in London, a new kind of public vehicle, borrowed from the French in 1831, was introduced, called an OMNIBUS, meaning, in Latin, 'with all persons.' [COACHES, *iv.* 676.] This has almost entirely superseded the old hackney coaches; and light CABRIOLETS, or Cabs (also from the French), are now in general use. These omnibuses, or *Busses*, as they are commonly called, owing to their moderate prices and constant regularity, have proved to be a great public convenience, and are now very extensively patronized.

In 1856, a General Omnibus Company was established, with the view of constructing these vehicles on a more commodious principle. They expended 10,000*l.* in building new ones, according to various plans, many of which were mere modifications of the old ones, which were found, as regards lightness of draft and freedom of ingress and egress for passengers, to answer every general purpose.' The following, however, may be considered as the now generally-adopted form of the

London omnibuses, taken from the directions issued to the company's coach-builders, under the title of 'Dimensions of Omnibuses to be observed by contractors in all future constructions.' Height from floor to centre of roof, 5 feet 10 inches. Width from back of seat to back of opposite seat, 4 feet 6 inches clear in every part. Ventilation round roof and through aperture with perforated zinc behind the coachman's seat. 17½ inches seat for each passenger. Each double-roof seat omnibus to accommodate 12 passengers inside and 12 outside. Each single-roof seat omnibus to accommodate 12 passengers inside and 9 outside. A strap along roof to be placed inside for passengers to steady themselves by. An alarm bell to be fixed near the conductor's seat, with two handles and communicating rod from inside, for passengers to signal conductor. Double-roof seat, unless otherwise ordered, with at least twelve inches fall for feet of riders. Raised rail round roof, and hand rail for back steps. Back steps to be at least twelve inches long, and to project four inches from body of omnibus. Front seats by side of driver to give at least sixteen inches for each passenger. All wheels to have patent axle boxes. Total weight of omnibus, with pole, cushions, &c., complete, under no circumstances to exceed one ton—to be weighed on inspection by the company's officers.

According to the report of the London General Omnibus Company, issued in November 1857, there were upwards of 800 omnibuses running along the various routes of the metropolis, of which 595 were the property of the Association. During the week ending the 31st of October, these 595 omnibuses ran in London not less than 222,779 miles, or nearly ten times the circumference of the globe, and they carried not less than 920,000 passengers. Assuming that the remaining one-fourth of the London omnibuses, not belonging to the company, carried an equal proportion, we have, as the travelling portion of the population of London, 1,115,000 persons. The population of London at the last census was 2,362,000, so that a number equal to nearly one-half of the people of London ride one journey in an omnibus every week.

The annexed return of the total number of vehicles, passing in the course of twelve hours through the principal streets of the city of London, will show its immense carriage thoroughfare:—

Lower Thames St., by Botolph Lane ...	1,380
Threadneedle Street	2,150
Lombard Street, by Birchin Lane ...	2,228
Upper Thames Street, Queen Street ...	2,331
Aldersgate Street, by Fann Street ...	2,590
Tower Street, by Mark Lane	2,890
Smithfield Bars	3,108
Fenchurch Street	3,642
Eastcheap, by Philpot Lane	4,102
Bishopsgate Street (City boundary) ...	4,110
Finsbury Pavement, by South Place ...	4,460
Aldgate High St., by City boundary ...	4,754
Bishopsgate Street (Great St. Helen's) ...	4,842
Gracechurch Street (St. Peter's Alley) ...	4,887
Cornhill (Royal Exchange)	4,916

Blackfriars Bridge	5,262
Leadenhall St. (East India House) ...	5,930
Newgate Street (Old Bailey)	6,375
Ludgate Hill (Pilgrim Street)	6,829
Holborn Hill (St. Andrew's Church) ...	6,906
Temple Bar Gate	7,741
Poultry (Mansion House)	10,274
Cheapside (Foster Lane)	11,053
London Bridge	13,099
Total	125,859

CARRIAGE-SPEED-MEASURER. This useful machine is intended to record the number of revolutions made by the wheel of a carriage, and thus indicate the distance which the vehicle has travelled in a given time. The apparatus is very compact, and is a contrivance somewhat similar in principle to the one devised by Watt for registering the number of strokes of a steam engine. The carriage-speed-measurer is buckled by straps to one of the spokes of the wheel near the nave, and as it revolves it causes a wheel to be advanced one tooth in each revolution, by which means the number of advanced teeth indicates the number of revolutions made by the wheel.

CARRU'CA, among the Romans, a four-wheeled carriage, which was covered and adorned with carved ivory or the precious metals. Its form was square with a pole, and it was drawn by mules; but its use was chiefly confined to persons of rank.

CAR'UCATE, in the Feudal ages, a plough-land, or carve of land about 100 acres in extent. The term is often used in Domesday books, and frequently mentioned by mediæval writers; some of whom say that it was as much land as could be tilled in a year by one plough. *Carucage* was a feudal tribute imposed on every plough for the service of the lord, precisely as *hidage* was a taxation on every hide of land. (Nuttall's *Archæological Dict.*)

CARVING (iv. 235). Among the great improvements of the age, to which the powers of machinery have been applied, may be mentioned that of 'Carving by Machinery,' which is effected by the precise, regular, and uniform action of steam power, and assists the carver in accomplishing those parts of his work which require most cutting and least precision. The process has been patented by Mr. Jordan, who was enabled to bring it extensively into operation at the New Houses of Parliament, where a considerable quantity in one pattern is required. The machine is thus described in a little work, entitled 'Novelties, Inventions,' &c.—'It resembles the sawing or planing machines in this—that the tools are fixed, while the wood is fed or conducted up to it. A pattern of the work to be carved is first modelled by the artist, and afterwards copied by the machine in wood with perfect accuracy, and in such a manner that two or three copies are made simultaneously. The carving thus prepared by the machine is then sent back to the artist, who introduces by hand the finishing touches. The carving machine thus does not exactly supersede the taste of carver; it is his labourer, employed to effect the rough cutting, which calls for more hand-work than head-work.'

CASHMERE (iv. 243-5). The death of Maharajah Gholab Singh, to whom this fertile province was ceded in 1846, took place in August 1857, and may probably lead to some important events. According to the treaty of 1846, he acknowledged the supremacy of the English, and bound himself to assist them with troops, if needful; in return for which he was to receive our aid against his enemies. His army consisted of 20,000 infantry, 2000 cavalry, and 1200 artillery, exclusive of an irregular force furnished by feudal chiefs. He was always a staunch friend to the English, and was possessed of considerable wealth; but his heirs are well-known to have hostile feelings against the European connections, and it is possible that the present agitated state of India may fan that hostility into a flame. For it is generally acknowledged that Cashmere treachery exceeds all that can be met with in India; and hence the common saying —Cashmeree, Beperee! (a Cashmere is without faith).

At this time, the population of Cashmere is computed at nearly a million; and both the men and women are looked upon as the finest-formed race in the East. The former are powerfully built, and the women are considered as the most beautiful in the world. Their complexion is fresh, and their features often of classical purity. The Moguls of Delhi have always paid enormous sums for the beauties of Cashmere, and made them the 'lights' of their harems.

CASSIDA'RIA (Lat. *cassida* a. helmet), a genus of Gasteropod Mollusca, with a short spire and ventricose shell, belonging to the family Muricidæ, and sub-family Nassinæ.

CASSIDA'RIÆ (Lat. *cassida* one of the genera), a family of Monilicorn coleopterous insects, or Tortoise beetles. The body of these insects is short and oval, and frequently concealed beneath the case wings.

CASSID'EA (Lat. *cassida* a helmet), a genus of Mollusca, of the sub-family Cassinæ, the shells of which are closely allied to the Cassis, but the aperture is wider.

CASSI'NÆ, a sub-family of the Murices, or Muricidæ, the shells of which are large, ventricose, and smooth, with a very short spire, and a truncated base.

CASSIS, the helmet-stone, belonging to the class Catocysti. It is also the name of a ventricose univalve, which is found both fossil and recent; the former occurring in the tertiary formations; the latter is an inhabitant of the tropical seas.

CASSYTHA'CEÆ, a genus of tropical exogenous plants allied to the laurels. They are without leaves, but scales occur here and there on their stems. It bears a flower similar to that of the laurel, with a six-parted calyx, and twelve stamens, the fruit of which is a nut.

CASTAGNETTA, or CASTANET (Span. *castaneta*), a small musical instrument formed of ivory, hard wood, brass, or concave shells, which is played by being fastened to the fingers, and rattled to the time or notes of a dance or song.

It is considered of Moorish origin, and was early adopted by the Spaniards as an accompaniment to their guitars and dances. The instrument, however, appears to have been primarily of eastern origin, and chiefly used by the Corybantes and the priests of Cybele, when it was known by the name of *crotalum*. It was made of two small brass plates, and its sound was somewhat like the noise which a stork makes with its bill, from whence this bird has received the name of *crotalistria*. Hawkins describes the crotalum as being made of a reed divided into two by a slit from the top, extending half way downwards, and the sides thus divided were struck against each other, and produced a lively clicking sound. Among the Greeks the *Crotalistriæ* were players on the castagnets, or girls hired to dance at festivals.

CASTEL'LA, among the Romans, the name of the reservoirs in which the contents of their aqueducts were collected, and from which the water was conveyed through pipes to the different parts of the city.

CAT, a warlike covered machine, used in the middle age by the besiegers of a castle or fortress, and so called because the soldiers, when beneath its cover, tore up the ground with their pick-axes, as a cat tears its prey. It was moved on wheels, and used for filling up the ditch, mining the walls, or preparing the way for the moveable tower which was to attack the ramparts. The *Castellated Cats* had chinks and crenelles, whence the archers discharged their arrows. The *Felis Eschinata*, or *prickly cat*, was a beam bristled with teeth, intended to be let down from the embrasures upon the heads of the besiegers. (Grose.)

CATACAUS'TIC CURVES (Gr. *καταϰαίω* to burn), in geometry, a species of curves formed by reflexion. The revolution of a circle along a circle forms a cycloid, which is called the catacaustic of a circle.

CATACOUS'TICS (Gr. *ϰατὰ* against, and *ἀϰούω* to hear), in acoustics, that part of the science which treats of echoes, or reflected sounds. It is sometimes called Kataphonics. Katacoustic sounds do not strike the ear directly, but first come in contact with other substances, and by them are refracted, and reverberate, like echoes, upon the ear.

CAT'APULT, a powerful military engine, used by the Romans for projecting large stones, arrows, and darts, in some respects similar to the Ballista. Some of them were so powerful, that they could discharge ponderous stones with such effect as to smash to pieces the thickest walls, or to destroy the strongest edifices at a blow. [BALLISTA, *Suppl.*]

CATARACT, in physical geography, a rocky precipice or other obstruction in the bed of a river, which causes the water to fall with a rushing noise and great violence. According to geologists it is chiefly in the primary and transitive formations of the earth's surface that the rivers exhibit those sudden descents which constitute cataracts or rapids. When they occur in countries of the secondary formation, they are of a more gentle character. They are usually found in the passage of rivers from the primitive to the other formations. There is this difference between cataracts and rapids. The cataract consists of a full body of water washing over a perpendicular or boldly-sloping precipice; and its sublimity or grandeur depends on the height of the fall, and the volume of water which is poured from the upper portion of the river. A rapid is produced by the rush of water down a steeply-inclined plain, without any precipice or suddenly-broken descent. Thus the celebrated cataracts of the Nile, when there are no very sudden falls of the river, may be considered as rapids. But in the second cataract, for about a hundred miles, there is a succession of deep descents, and numerous rocky islands, by which the water assumes the appearance of a succession of foaming rapids tossed in perpetual eddies. In the same manner the river Adige, in the Tyrol, rushes with resistless force and a tremendous noise down a descent nearly a mile in length; and it thus presents one of the most magnificent spectacles in Europe. In the Shannon, just above Limerick, where the river is forty feet deep, there is a rapid not unlike the Adige, though on a smaller scale. It pours its vast body of water over masses of rock, for nearly half a mile, and thus renders the river, at this part, entirely unnavigable. In Sweden the river Gotha, at Trolhetta, falls about 130 feet, and presents a very imposing aspect. It is considered the greatest fall in Europe. The moving mass of water is tossed, in its descent, from rock to rock, boiling and foaming in tumultuous eddies, and appearing like one beautiful sea of snowy froth; and when the wind disperses the thick spray, the vast abyss into which the torrent rushes is revealed, but the eye cannot penetrate its deep recesses. In the Alpine highlands the river Orco forms a vertical cataract of 2400 feet, and the Evanson descends 1200. The Teverone, near Tivoli, though a comparatively small stream, is precipitated nearly 100 feet, and the Velino, near Terni, 300. Lord Byron says that the Velino, or the 'hell of waters,' as he calls it, is 'worth all the cascades and torrents of Switzerland put together.' At Staubbach, in the Swiss canton of Berne, there is a comparatively small stream which falls 1400 feet, and is scattered almost entirely into spray before it reaches its point of descent. In Scotland there are a few heavy falls of water, but of no great magnitude as cataracts; still the rocky beds and precipitous glens through which the dashing waters roll, impart considerable grandeur to the scene. The Upper and Lower falls of Foyers, near Lock Ness, are remarkable instances. At the Upper Fall, the river precipitates itself with rushing violence down three distinct precipices, whose united depths are 200 feet. But when the dashing foam arrives at the third precipice, it makes a descent at once of 212 feet. After a heavy fall of rain this treble-formed cataract presents a most magnificent spectacle.

It is, however, on the great American Continent where cataracts and waterfalls present themselves on the grandest scale. They are there like the rushing of mighty rivers. In North America is the greatest of all cataracts, the mighty

Niagara, which travellers admit to be the sublimest spectacle, as a waterfall, in the whole world. The river, which brings down this vast flood of water, flows from lakes Erie and Ontario. It is about thirty miles long, and three quarters of a mile wide at the fall. This mighty cataract is divided into two unequal portions by the intervention of Goat Island, which is about 1000 feet in breadth. The fall, on the American side of the river, is 1140 feet broad, and 164 in height. But the one on the British side, called, from its peculiar shape, the Horse Shoe Fall, is by far the most imposing. Its breadth is 2100 feet, and its height nearly 150 feet. Mr. Buckingham, in his account of this stupendous cataract, thus notices the two sides of the river. 'As the grandeur of the Horse Shoe Fall is best seen from the edge of the Table Rock, so the grandeur of the American fall is best seen from the approach to the landing-place, where you are wetted with the spray from the plunge into the deep mass below, the depth of which has been ascertained, by sounding, to be 240 feet. The upward look towards the summit of this foaming cataract, when the full force of the torrent is seen rushing over the crest or edge of the precipice, and when there is no intervening object between it and the sky, is terrifically impressive, as we feel that if the boat should be drawn into the vortex, which a few feet only from the landing-place would be sufficient to effect, the weight of a million of tons descending at once, would crush the frail bark into nothingness; the computation being that the amazing quantity of 3,530,614 barrels of water descend every minute, or 211,836,840 barrels in every hour. The ascent of the winding flight of stairs projected at different angles along the shelving and rocky precipice, and ascending to a height of above 200 feet from below, affords many imposing views of the same magnificent sheet of water; and on reaching the summit, the full career of the impetuous rapids, foaming along for a mile above the edge of the descent, adds to the wildness and grandeur of the whole.' The mass of water continually rolling over these falls dashes over the precipice with such force, that it forms a gracefully-curved sheet which strikes the stream below at the distance of fifty feet from the base. According to the geologists the force of the waters appears to be wearing away the rock over which they flow, and gradually shifting the cataract higher up the river, at the rate of 150 feet in fifty years.

Although the cataracts of the western world are the most numerous in North America, the greatest vertical descent of water is in the southern continent, at the falls of Tequendama, where the mighty river Funza disembogues itself from the elevated plain of Santa Fé de Bogota. This plain, or valley, is surrounded by lofty mountains, and lies at a greater height above the level of the sea than the Alpine summit of the Great St. Bernard. It appears to have once been the bed of an extensive lake, whose waters at some distant period have forced the narrow passage through which the Funza River descends from the elevated valley above. The Tequendama cataract is strikingly picturesque; the height of the fall being 574 feet, and the river a little above it upwards of 140 feet broad. The column of vapour, which rises from this vast rush of waters, is visible at 17 miles' distance.

CATAS'TASIS, in the Greek drama, the third division of a tragedy, wherein the action or intrigue in the preceding portion of the drama, called the Epitasis, is supported and brought towards the catastrophe, or final unravelling of the general plot.

CATASTROM'ATA, among the ancient Greeks, were platforms elevated on the fore and aft parts of their ships, on which the soldiers stood and discharged their missiles on the enemy with great force and effect. At the celebrated battle of Salamis these platforms were of great utility in attacking the Persians.

CATHCART, LT.-GENERAL SIR GEO., commander of the fourth division of the British army in the Crimea, and brother of the present Earl Cathcart. He was born in London in 1794, and commenced his military career, in the 2nd Life Guards, in 1810. In 1812 he accompanied his father, the distinguished general and diplomatist, in the capacity of aide-de-camp, when his lordship was sent as plenipotentiary to Russia, to conclude a peace with the Emperor Alexander. When in his nineteenth year, and a lieutenant in the 6th Dragoons, he joined the imperial head-quarters of the armies allied against Napoleon; and throughout the whole of the eventful campaigns of 1813 in Germany, and 1814 in France, he was with the grand army. He was thus present at the great battles of Lutzen, Bautzen, Dresden, Culm, Leipsic, Brienne, Bar-sur-Sube, Arcis-sur-Aube, &c., and finally at the capture of Paris and expulsion of Napoleon. In 1850 General Cathcart published a volume of Commentaries on these campaigns, which proves that, although so young in office, he was a rigid observer of the lessons in the art of war, furnished in the several hard-fought fields, from May to Nov. 1813. The book is a clear soldier-like account of an important epoch in modern history, when Napoleon was driven across the Rhine, and his empire eventually wrested from him. After the peace of 1814, young Cathcart accompanied his father to the congress of Vienna; and being in that city when Napoleon escaped from Elba, he was appointed aide-de-camp by the Duke of Wellington; and in that capacity he accompanied his Grace to the Netherlands and France, and was present at the battles of Quatre Bras and Waterloo. He afterwards accompanied the Duke to the Congress of Aix-la-Chapelle, in 1818; to Verona, in 1822; and to Prussia, in 1826. In 1828 he was promoted to the command of the 57th Foot, as lieut-colonel, and for about seven years served in Nova Scotia, Bermuda, and Jamaica. He was afterwards appointed commander of the King's Dragoon Guards; and as senior officer he was placed in command of all the troops south of the river St. Lawrence. Here, at the head of 5000 men during the commotions in Canada, he had to protect the whole frontier line of Lower Canada from the perpetual inroads

of the refugees and sympathisers. In 1852, on the recommendation of the Duke of Wellington, he was appointed Deputy-lieutenant of the Tower; and during the same year he was sent as governor of the Cape of Good Hope, where he brought the protracted Kaffir war to an honourable conclusion. For his long and distinguished services he was, in 1853, appointed Adjutant-general of the army. On his return from the Cape he was sent out direct to the Crimea, as General of division; and was there slain, at the sanguinary battle of Inkermann, in November 1854.

CATHEDRALS (iv. 286, 545). The cathedral churches of England are chiefly built in the style of architecture usually denominated *Gothic*, or *Pointed*, which arose after the decline of the Roman power, and flourished during the middle age. Its distinguishing characteristics are the pyramidal form, with a nave, choir and transepts, the pointed arch, a lofty tower or steeple, buttresses, clustered columns, and various styles of decorative sculpture and carving. The cathedrals of Canterbury, Salisbury, Lincoln, Ely, Durham, Oxford, Wells, York, Winchester, Lichfield, Peterborough, and Westminster Abbey, are magnificent specimens of this truly English system of architecture. The different periods at which our cathedrals were built, are usually indicated by the peculiarities of the style. For instance, that which prevailed during the reigns of Henry III. and Edward I., is usually denominated *Early English*. From that period to the time of Henry VI. (1300 to 1460), it is styled *Ornamental English*, and from 1460 to 1530 it is known as *Florid English*. The style which prevailed in the reign of Elizabeth is generally termed *Tudor Gothic*. Henry VII.'s chapel, at Westminster, is a beautiful specimen of that height of elegance to which the Gothic style arrived in the sixteenth century. About this period the taste for the Gothic style of cathedral architecture, may be said to have declined, although its solemn and imposing grandeur is perhaps better suited for religious purposes than any other. In the sixteenth and seventeenth centuries the chaste architecture of the Greeks and Romans began to revive. It was first introduced into Italy, and adopted for religious edifices. It was a kind of ornate Roman, or what may be very appropriately denominated *Greco-Roman*. From Italy this style soon passed into other parts of Europe, until at length we were enabled to produce architects capable of rivalling the great Italian masters, especially Inigo Jones and Sir Christopher Wren, who have left behind them many splendid classical edifices, which will long remain the pride and ornament of the country.

The two principal cathedral churches in Europe, which have been constructed on the Greco-Roman style, are ST. PETER'S at Rome, and ST. PAUL'S of London; the one being the principal ecclesiastical edifice of the Roman Catholics of Central Europe, and the other, of the Protestants of England. They are unquestionably two of the most magnificent ecclesiastical buildings of modern times. St. Peter's may be esteemed a master-piece of pure Greco-Roman architecture; and in the surrounding adjuncts, which strike the spectator with so much admiration, it is infinitely superior to St. Paul's. The circular area, which lies before this noble pile, is encompassed by a beautiful peristyle, or colonnade, consisting of 284 marble pillars of the Doric order, which support an architrave adorned with statues of saints and martyrs. The surrounding piazza too has an air of sublimity. The double colonnade, extending on each side in semi-circular sweep, the stupendous Egyptian obelisk, the two fountains, and the admirable façade of this stupendous edifice, form such an assemblage of magnificent objects as cannot fail to impress the mind with solemn wonder. From the spacious area there is a flight of steps to a grand terrace which leads into the lofty portico before the church. This portico is supported by pillars eighteen feet in circumference; and over it are placed the statues of our Saviour and the twelve apostles. The great body of the church, with the magnificent cupola which surmounts it, is sustained by several massy square pillars; and under the middle of the cupola stands the high altar, 90 feet high, most tastefully formed, and beautifully decorated with various emblematic figures. The height of the building, from the floor to the summit of the cross, is 432 feet; and the diameter of the ball which surmounts the dome exceeds 80 feet. The numerous little chapels and altars, and the various paintings, carvings, and statues, which run round the church are so well arranged and disposed, that nothing appears superfluous or out of place. St. Peter's chair, supported by four gigantic figures, and extending to the roof, is a magnificent work of art. The Mosaic pictures, representing several pieces of scriptural and ecclesiastical history, appear to equal anything of the kind produced by the ancients. [MOSAIC, *Supp.*] There is nothing, however, in this colossal structure, so worthy of admiration as the wonderful symmetry and just proportion of all its parts. Notwithstanding the statues, columns, pictures, and numerous artistic adornments with which it abounds, there appears nothing that could with propriety be dispensed with.

The cathedral of St. PAUL'S, in London, is constructed on the model of St. Peter's, and in the purest style of Greco-Roman architecture. It was built by Sir Christopher Wren, in the time of Charles II.; but although the structure was commenced in 1675, and completed in 1710, the decorations were not finished till the year 1723. The building is cruciform; and its length from east to west, including the porticos, is 500 feet; its breadth 311, and its extreme height 344 feet. On the outside it consists of two ranges of pilasters, one above another; the lower range being of the Corinthian order, and the upper one of the composite. The west front is adorned with a magnificent portico, supported by twelve massy columns of the Corinthian order; above which are eight composite columns supporting a beautiful pediment, in which is sculptured the history of St. Paul's conversion. The ascent to this portico is by a flight of black marble steps; and an elegant turret appears over each corner. On the south side of this edifice is a splendid portico, with a

dome supported by six columns; and on the pediment is a phœnix in flames, with the word *resurgam* (I shall rise again) sculptured beneath it. The portico on the north side corresponds with the south; its pediment being embellished with the royal arms and other decorations. But the most striking and imposing feature of the building is the stupendous cupola or dome, which, from its towering height, is observable in almost every part of the metropolis. From this lofty dome springs a circular range of columns, terminated by an entablature which supports a handsome gallery; and the whole is surmounted by a gilt ball and cross. On the inside, the dome is sustained by eight massy columns, and the roof of the choir is supported by six pillars. On each side of the grand nave are two aisles, the pillars of which support the roof. Round the interior part of the cupola runs a handsome iron balustrade, known as the whispering gallery, where the lowest whisper or smallest noise can be heard at the utmost distance of the range. The floor of the edifice is paved with marble, and the ceiling of the dome is beautifully adorned with emblematic paintings by Sir James Thornhill. The clock-works also are a wonderful production of art. The weight of the bell which strikes the hours is 11,474 lbs. The sound has been heard at the distance of twenty miles. The clock dial is fifty-seven feet in circumference; and the minute hand eight feet in length. The entire edifice is inclosed by a handsome iron balustrade. The whole expense of erection and finish of this stupendous fabric has been estimated at 736,752*l.*

CATH'ETUS (Gr. κάθετος perpendicular), in geometry, a radius or line falling perpendicularly on another line or surface. Thus the catheti are the two sides that include the right angle. The term is also applied to other branches of science; as, for instance, in Catoptrics, the *Cathetus of incidence* is a right line drawn from a point of the object, perpendicular to the reflecting line. (Craig.)

CAT'S-EYE, a beautiful mineral, with an opalescence resembling the light from the eye of a cat, whence it has received its name. It is a variety of rhombohedral quartz; the finest specimens of which are brought from Ceylon. Its constituent parts are 95 of silex; 1·75 of alumine; 1·75 of lime, and 0·25 of oxide of iron.

CATTLE (iv. 291–4). Cattle-breeding, both in England and France, has of late years become an object of vast social importance. It appears, from recent statistical returns, that in both countries an equal number of sheep are bred, being about 35 millions. In the United Kingdom these 35 millions live on 78 million acres, or 31 million French hectares; while in France, the same number of sheep live on 132 millions of acres, or 53 million hectares. It thus follows that the English breed two sheep, where the French breed only one. This is not all. In many of the departments of France, the production of fine wool has been encouraged, to the detriment of the production of meat; while the chief attention of the English is devoted to the production of meat. It thence results that the 35 million French sheep produce annually 120 million lbs. of wool, and 288 million lbs. of meat; whilst the 35 millions English sheep produce 120 million lbs. of wool, and 720 million lbs. of meat. The proportion of mutton produced in France and England exists in the very disproportionate figures of 720 to 288. In these figures France is compared with the British Isles, this comprising the hilly regions and moors of Scotland, as likewise the poorer districts of Ireland. On confining ourselves to England proper, the contrast is even greater. England breeds two sheep per 2§ acres against two-thirds of a sheep bred by France, the produce of an English sheep being more than double that of a French one. So much for the ovine race. In England the consumption of milk is considerable, and cheese forms an important article of food. The county of Cheshire alone supplies cheese of the annual value of a million sterling. Milk is sold dearer in England than in France; French cows produce 1000 million quarts of milk, which is sold at an average price of one penny a quart. The English cows produce double the quantity, which is sold at double the price; consequently the English agriculturists derive a profit four times larger than French farmers. The English breed 8 million head of cattle on 78 million acres. The French breed 10 millions on 137 million acres. Therefore the English, on an equal surface given, possess more cattle than the French. The butchers of France slaughter annually 4 million head of cattle, which produce 1000 million lbs. of meat. The English slaughter annually 2 million head, and yet obtain above a quarter more meat than the French. In France, out of 4 million head of cattle slaughtered, calves figure for 2½ millions, while in England very little veal is eaten. In England, oxen rarely work in the fields and they attain considerable fatness. In France cattle are slaughtered after several years' labour; they are fatigued, exhausted, and afford very little meat. The French cattle give annually in milk 4,000,000*l.*; in meat 16,000,000*l.*; in labour 8,000,000*l.*; total 28,000,000*l.* English cattle give annually in milk 16,000,000*l.*; in meat 20,000,000*l.*; total 36,000,000*l.* Thus a cow in England produces more by its milk and meat than the same animal in France by its milk, meat, and labour. (*Agricult. Journal; Galignani's Messenger.*) [Islington Cattle Market.—*Suppl.*]

CAUCASIAN RACE. Ethnologists generally divide the great family of man into three distinct races, with their sub-divisional branches; viz. the Caucasian, or White; the Mongolian, or Olive-coloured; and the Nigritian, or Black; the two latter of which are described under their respective heads. Of these, the Caucasian race, which comprehends the great European family, and some of the Asiatic nations, is by far the most civilized, and presents the finest physiological development of the genus *Homo*. This race has received the name of Caucasian, because their traditions and genealogies appear to carry them back to that extensive and mountainous country, lying between the Caspian and the Black Seas, where civilization and the arts are known to have

existed from the remotest periods of antiquity. Of the different branches that have ramified from this remote region, we have the Armenian, or Syrian, which spread southwards, and produced the Chaldeans, Assyrians, Arabs, Phœnicians, and Jews; and probably the Egyptians. From the Indian, Pelasgic, and Teutonic branches many great nations have been derived; and likewise several important languages; as the Sanscrit, which is the sacred language of the Hindoos, and the mother of all the Hindoostanee tongues;—the Pelasgic, which is the parent of the Greek, Latin, and various derivative languages existing in the south of Europe; the Sclavonic, from which the Russian, Polish, and Bohemian are derived; and, finally, the Teutonic or Gothic, from which the German, Dutch, Swedish, English, and the various dialects thereto belonging, are deduced. The north-east of the Caspian Sea is still inhabited by people who have the same Caucasian origin, and speak similar languages; but some of them are intermingled with a variety of Tartar races of different casts; and their Caucasian origin thus becomes obscured. The ancient Persians spring from the same source as the Indians; and their descendants have all the characteristics of the great Caucasian family.

It is from these Caucasian races that civilization in all ages appears to have emanated, and that philosophy, science, and human learning, when unobstructed by monarchical tyranny or military despotism, have flourished, and long continued to promote the arts of civilization.

CAU'CASUS (iv. 296). Since the protracted struggles of the Circassians and other mountain tribes of this extensive region with the giant power of Russia, the Caucasus has attracted a considerable degree of public attention. Although the Circassian race is the best known to Europeans, there is a great variety of tribes extending from the Caspian to the Black Sea. Geographers have divided the Caucasus into three distinct regions: the Eastern Caucasus (with its high chain of glaciers) called Chat Tagh, and a series of granitic peaks that attain an elevation of above 12,000 feet); the Central or Snowy Caucasus (with several summits that exceed 15,000 feet in elevation); and the Western Caucasus (with Mount Ebrus for its culminating point). But the whole constitutes one vast mountain land, inhabited by such numberless tribes, that it would require a regular vocabulary to give them names. Some are the remains of Asiatic hordes, which, in their great migrations, passed and repassed these mountains; but the greater portion appear to be primitive or indigenous tribes. The primitive Caucasians are the Leghis in the east, the Mizdsheges in the centre, the Tcherkess or Circassians, and the Abasses in the west. The Georgians and Ossetes are the new inhabitants of the territory. The latter are said to be the descendants of a Scythian colony, which was established here about seven centuries before the Christian era. Among these numerous nations and tribes, the Suanethes, the Lesghis of Avar and Andi, the people of Kazi-Kumuk, and those of Dido, alone preserve perfect independence; the Abassians, the Circassians, the Kistes, the Tchetschenses, the Nogays, and the Ossetes, preserve a partial independence. But of all the tribes of the Caucasus, none more than the Circassians fully realize those heroic qualities for which these brave mountaineers are distinguished. Nature appears to have endowed them with courage, intelligence, and remarkable beauty of person. Almost eternally engaged in war they are in general well-armed, their equipments consisting of a rifle, a sabre, a long dagger which they wear in front, and a pistol stuck in their girdle. They are wonderfully expert in the use of fire-arms, and of the double-edged daggers, as their late contests with the Russians have demonstrated. Armed with this weapon they have been known to leap their horses over the Russian bayonets, stab the soldiers, and rout their squared battalions. [CIRCASSIA.]

The aggressive career of Russia, in the north of the Caucasus, is not of modern date. The early subjection of Georgia, Imeritia, and Mingrelia, and the opening of a road into the very heart of the Caucasus, did not fail to arouse the natives to a sense of the danger that threatened them. Violent commotions were soon excited, and the mountaineers took part in every coalition formed against the common enemy. It was not, however, till Russia was relieved from all her quarrels with Persia and Turkey, about thirty years ago, and had been confirmed in her hold of Anapa and Su-juk Kalah, by the treaty of Adrianople, that she directed all her efforts against the western mountaineers, and began that war which she has now carried on for nearly thirty years, without obtaining any definite results. The treaty of Adrianople, by which Turkey undertook to cede the Circassian territory to Russia, was in a manner a new era in the relations between that power and the mountaineers of the Caucasus; for it was by virtue of that treaty that the late Czar Nicholas pretended to the sovereignty of Circassia, and of the whole seaboard of the Black Sea. But this proprietary right to the country was altogether fallacious, for Turkey never possessed any right over Circassia. She had merely erected on the seaboard, with the consent of the inhabitants, the two fortresses of Anapa and Su-juk Kalah, for the protection of the trade between the two countries [ANAPA, *Suppt.*], and Russia herself formally acknowledged this state of things. Notwithstanding, she still appears bent upon the entire subjugation of the Caucasus; and her capture of the important fortress of Kars added materially to the prestige of her strength. It is in fact difficult to imagine a more perfect system of fortresses than that which Russia has adopted, to hold these countries of hardy warriors in subjection. The course of the great mountain chain is W.N.W., and the high roads, with their continuous chain of forts to the north and south, follow the same direction. Although Russia obtained the whole of Georgia by the treaty of 1813, it was not till 1828 that she acquired the additional provinces of Naktschivan and Erivan, with the fortresses of Uttsighur, Akhalziche, and Akhal-Kalaki and also the important fortresses

of Anapa and Poti, and was thus enabled to establish a firm footing on the whole of the eastern coast of the Black Sea, from the Kuban to Fort St. Nicholas. On the Caspian side of the Caucasus the same system of fortification has been carried on. From the fortress of St. Ekaterinograd, which commands the northern fort of the Pass of Dariel, a road has been carried by Mozdok and St. Naour to Turki, on the Caspian, and thence by Derbend and Kuba to Baku, which unites the Caspian with the Euxine, south of the Caucasus. The same junction is effected to the north from St. Ekaterinograd, by Gheorghievsk, or Gheorgie, Aleksandrof, Stavropol, and a whole line of forts along the Kuban to Tmoutarakan, on the strait of Kertch, between the sea of Azof and the Black Sea. In the midst of this vast system of fortresses rises the mighty Caucasus, covered with impenetrable forests, cut up by inaccessible ravines and precipices, and clothed with perpetual snows, attaining, in its culminating point Mount Ebrus, an elevation of 17,832 feet, and bidding defiance, as it were, to the pigmy constructions of men. Notwithstanding all these formidable demonstrations the Russian government is fully sensible of the danger to which her occupation is continually exposed, from the aggressive spirit of the Caucasian tribes, who only require union, under one influential leader, to spread the flame of general revolt against Russian domination. For the last thirty years the Russians have exhausted against them all the military talent which the empire could supply. No sacrifices in men and money have been spared, and the most distinguished generals, Yermoloff, Paskiewitsch, Gortschakoff, the two Viliaminoffs, Rosen, Rajewski, Aurep, Golovine, Veidhardt, and Woronzoff, have in turn commanded there, but without producing any lasting effect. On the contrary, the tribes of the mountain have grown bolder in warfare, and each year sees them stronger and more menacing. The art of war has made much progress among them. Success has inflamed their ardour. Old hatreds and rivalries are gradually disappearing, and the tribes feel more than ever the necessity of acting in concert against their restless invaders.

CAUL (Lat. *caula* a fold), an adipose and thin membranous viscus of the abdomen, lying on the interior surface of the intestines, and attached to the stomach. It is the common English name for the *omentum*.

CAURSINES, Italian usurers, who took up their residence in England at the beginning of the 13th century, and called themselves the Pope's merchants. They received their name, according to Cowell, from Caorsi, a town in Lombardy, where they first practised their usurious profession. They spread themselves over Europe, and at length became such pests to society, that the then Bishop of London excommunicated them, and, in 1240, Henry III. banished them from England. In the year 1250, however, they were allowed to return, under the plea that they were the pope's money-changers. But their exactions eventually became so intolerable that they were altogether expelled from the country. (Matt. Paris.)

CAVÆDIUM, the large and central apartment of a Roman palace or mansion, the ceiling or dome of which was sustained by lofty pilasters or columns. It had no windows, but was lighted by an unglazed sky-light, called a *compluvium*; and on the floor below this, was the basin, or *impluvium*, to receive the rain which fell from the roof. The cavædium was considered the grand state room of the family, in which were kept the images of ancestors, paintings, statues, and spoils of war.

CAVAIGNAC, GENERAL LOUIS EUGENE, was born at Paris in 1802. He was the son of the old Conventionalist Cavaignac; and both he and his brother were staunch republicans. He commenced his military career by receiving a commission from the Polytechnic School, of which he was a member; and in 1828 he engaged in the French expedition to the Morea. On his return to France he openly avowed his republican sentiments; and, by way of honourable expatriation, he was appointed, under Louis Philippe, to the command of the French Army in Africa. In his contests with the Algerines and the Arab tribes of the surrounding districts he displayed great military skill, and acquired the highest distinction as an able general. In 1847 he succeeded General Lamoricière as commander-in-chief of the province of Oran, and the following year was appointed to the governor-generalship of the important province of Algeria, in which he signalized himself by his great judgment and firmness. On the overthrow of Louis Philippe, in 1848, he returned to France, for the purpose of sitting as a delegate in the National Assembly for the department of Lot and Garonne, in Guienne. Under the Provisional Government of 1848, he held the rank of general of division, and on the memorable outbreak of the 22nd of June of that year, he was appointed minister of war and absolute dictator. The sanguinary contests which attended that revolutionary struggle are matters of history. There was continuous fighting for four days in the streets of Paris, during which the killed and wounded on both sides amounted to upwards of eight thousand, including the Archbishop of Paris and many distinguished general officers. Cavaignac displayed considerable energy and skill in directing the movements of the artillery and troops against the formidable barricades which crowded the streets of Paris, and which at one time seriously endangered the safety of the city, and threatened the destruction of the existing government. In fact, Cavaignac, at that time, was considered the sole arbiter of the destinies of Paris and of France. No sooner, however, had he subdued the rebellion, and pacified Paris, than he laid down his dictatorship; but the National Assembly appointed him President of the Council, with power to nominate his own ministry. In the general election of a president of the republic, which subsequently took place by universal suffrage, Cavaignac stood the second on the list of candidates, having polled 1,448,302 votes; while the present Emperor of the French polled upwards of five millions. On resigning his extraordinary powers, he received the compliments of his successor, and at the same

time the thanks of the National Assembly. At the memorable coup-d'état of December 1851, Cavaignac, as well as many other distinguished characters, was arrested in his bed-chamber; but after a brief detention he was liberated, and retired unmolested into private life, though he never acknowledged the Emperor, or acquiesced in the restoration of the empire. He still continued to hold his republican principles, and never accepted public employment. At the general election, in July 1857, he was returned, in opposition to the government, as one of the ten deputies of Paris. But his death took place in October of the same year, and thus were the hopes of the republican parties of France, of whom he might be considered as the indisputable head, altogether annihilated.

CAVAN, County of, in Ireland (iv. 303–5). According to the census of 1851, the population of the county was 174,303; and the inhabited houses 40,964. The population of the principal places was as follows:—

Bailieborough par.	6,984	Cootehill	2,425
——— t.	1,203	Killeshandra pa.	12,552
Ballyjamesduff	1,071	——— t.	1,085
Belturbet	1,620	Kingscomb	1,614
Cavan	3,740		

CAVERN TEMPLES, ancient excavations, or mausolea for the interment of the dead, or the performance of religious rites. They have been discovered in various parts of the world, and at different periods. The extensive caves of Elephanta and Ellora in India, and that of Trophonius in Greece, are celebrated instances. They are generally formed with entrances, halls, adyta, sacella, &c.; and that of Trophonius was adorned at the entrance with obelisks and brazen pyramids. In Ireland the caverns of Anna Clough Mullen and New Grange are curious specimens of Druidical cells, to which, it is supposed, the people resorted for divination, or spiritual consultation. They appear like tumuli, or cairns, but contain apartments within. The cavern of Anna Clough Mullen consists of a semicircular vestibule leading to a series of four chambers, one behind the other, of an oblong square form. In the New Grange there are three recesses, one facing the avenue, and one on each side. Sir R. C. Hoare has minutely described this curious remain. In the recess on the right is a large stone vase, denominated by antiquaries a rock-basin—no doubt originally intended for religious rites. The rude stones composing this recess are decorated with various devices. The avenue or gallery leading to the inner area is formed by large upright stones placed perpendicularly on each side; these support the flat stones of the roof, and rise gradually until they reach the dome, which appears to be formed after the fashion of our staircases. The tallest of the stones which form the adit to the sacellum is seven feet and a half high. General Vallancy pronounces this cavern to be Druidical, and Sir R. C. Hoare ascribes it to the Celtic or Belgic tribes. When the cave was first opened, two entire skeletons were found, as well as cistvaens, or tabernacles. (*Maurice's Indian Antiq.*; Sir R. C. Hoare. Vallancy.)

CAVERNS, SUBTERRANEOUS. In mountainous regions, and especially in the massive limestone rocks which are there formed, immense fissures and caverns are often found, of which there is some difficulty in philosophically explaining the origin. Hence some wild theories have been advanced, with the view of endeavouring to account for their formation. Their origin, however, may be generally traced to the elevation or depression of the strata of the earth's surface through the violent action of water, or by the force of volcanic agency. Some caverns are deeply subterraneous, and from these, rivers sometimes take their rise, while in others their streams are lost. Of the existence of subterranean caverns, beyond the range of observation, we are assured by the phenomena which accompany the activity of volcanic force, and also by springs and other manifestations of internal action. In some of the caverns of Norway the roar of the subterranean torrents may be heard as they rush along their contracted channels within their immeasurable depths. Hence we find that caverns usually consist of a series of deep recesses and galleries, to which the first opening space is but the vestibule.

It is to the distinguished cosmographer Baron Humboldt, that the scientific world is indebted for the important information he has afforded respecting the cavities which numerously exist under the earth's surface. In the primary rocks, they are comparatively but few; yet those few are often of great extent, and sometimes of unknown depth. In Sweden and Norway the granite formations present caves and fissures of extraordinary magnitude, and hitherto entirely unexplored, of which the vast cave of Marienstadt, and the deep hole of Frederickstall, may be mentioned. A stone thrown into the latter cavity does not re-echo its fall in much less than two minutes, which would give a precipitous depth of nearly 60,000 feet. Near the falls of Niagara, in North America, there is a huge rock, known by the name of the Table Rock, and beneath this is a tremendous cavern formed by the projection of a ledge over which the volume of water rolls in awful grandeur. The gloom of this cavern, the whirlwind that eternally rages within it, the deafening roar of the vast abyss of convulsed waters that play beneath, and the falling columns that hang above, strike the beholder with amazement. Some time ago, a portion of the Table Rock fell, and in that still remaining the eye traces an amazing fissure from the very summit of the projecting ledge over which the water rolls; so that the ceiling of this dark recess appears rent from the precipice. The cavern formed by the projection of this vast superimpending rock extends some distance behind the water. 'I have seen those,' says a recent traveller, 'who have stood behind the edge of the mighty sheet of water; but as for myself, when I descended within a few paces of this dark recess, I was obliged to hurry back some yards to draw breath. Their lungs must be little short of miraculous that could play in the wind and foam that gushed from the hidden depths of this watery cave. It is probable, however, that the fracture of the rock has

considerably narrowed the entrance, and thus increased the force of the blast that meets the intruder.' It is in the same way that from the cavern of Mount Eto, near Turin, an intensely cold and piercing wind proceeds, while from others spring vapours of a malignant character.

It is, however, in the mountains of stratified limestone that caverns most frequently occur. The caves of Westphalia, the grotto of Nôtre Dame, between Grenoble and Lyons, and the celebrated caves of Franconia, occur in what may be called the cavern limestone formation. But the extraordinary caverns of Derbyshire may justly rank among the wonders of geological science. The Peak cavern is magnificent. The entrance or vestibule is a deep depressed arch, 40 feet high and 120 wide; and the cave itself is about 800 yards in length. That 'horrid fathomless cavern,' Eldon Hole, is a deep yawning fissure in the limestone strata, about 60 feet long, 20 wide, and of uncertain depth. In 1781, a Mr. Lloyd descended, and found the light, at what he considered the bottom, to be sufficiently strong to enable him to read. He then discovered a fissure in the rock, through which a strong current of air proceeded; this was presumed to be the entrance to another cavern, but as it was blocked up by large stones, which, it appears, had been thrown in a few years ago, Mr. Lloyd had not the means of examining the interior of the second chasm which presented itself.

In the vicinity of Nottingham, and especially beneath the castle heights, there exists the new red sandstone formation; and here we have remarkable instances of the scooping out of caverns, which takes place wherever a given quantity of water obtains access, and can undermine any portion of the rock without bringing down the superincumbent mass. Under Nottingham Castle the natural erosion of the water has left wide open spaces, and the harder portions of the rock having resisted the onward course of the subterranean streams, they stand like pillars supporting the roof, and present a very picturesque and imposing effect.

But these geological phenomena, resulting from the same causes, present themselves in a still more imposing form in some parts of Germany, especially in what is called Saxon Switzerland, near Dresden. For a considerable distance the river Elbe makes its way through narrow gorges deeply cut through a coarse-grained sandstone. But the cavernous abyss (we quote from Russell's 'Germany') 'which lies sunk behind the summit, called the Bastei, though not so regular as some others, is the most wonderful of all, in the horrid boldness and fantastic forms of its rocks. The Ottawalder Grund is so narrow, and its walls are so lofty, that many parts of it can never have felt sunshine.* * * Some huge blocks, in their course from the summit, have been jammed in between them, and form a natural roof, beneath which you must creep along,—above the brook or planks, if the brook be small, or wading in water, if it be swollen; for the rivulet occupies the whole space between the walls in this narrow passage, which goes under the name of 'Hell.' When, in one of these lanes, you find an alley striking off on one side, and having squeezed your body through it, another similar lane, which you soon find crossed by another of the same sort, you might believe yourself traversing the rude model of some gigantic city, or visiting the ruined abode of the true *terræ filii*.'

Some of the caverns, which have been examined in Europe and elsewhere, are grotesquely covered with pendent masses of calcareous formation, or stalactites, which present the most fantastic and curious shapes. In the island of Antiparos, which forms one of the Cyclades of the Grecian Archipelago, there is a cavern known as the 'Grotto of Antiparos,' which is accounted as one of the greatest natural curiosities in the world. It is 120 yards long, 113 wide, and about 60 high. It forms an immense arch, full of stalactite incrustrations, and all over lined with fine and bright crystallized marble. From the roof and sides of the cavern are suspended long icicles, or stalactites, some of them 10 feet long. When the cavern is illuminated by torches, it exhibits a kind of fairy picture, representing trees, flowers, pillars, rivers, and almost every object which the imagination of the beholder can possibly conceive.

There are some caverns remarkable for the development of mephitic gas, which often renders them dangerous to enter. This noxious exhalation appears to arise from a kind of earthy limestone, which is impregnated with bitumen, and has the property of giving out all its carburetted hydrogen in the air. Caverns of this nature generally occur in the volcanic regions of the globe, or where volcanic processes may be presumed to be going on in the bowels of the earth; and there can be no doubt of this pent-up gas being an active agency in producing earthquakes and volcanic eruptions. The gases so developed are chiefly, if not entirely, the sulphuric and carbonic acids. Among the most important of the caverns which give out this mephitic gas, may be mentioned the Grotto del Cane, at Naples, near Pozzuoli. It is very unimportant in size; but the cave and its vicinity appear to have undergone some considerable changes; for we learn from Pliny, that the mephitic gas exhaling from this cavern was fatal to human life, which is not now the case, although small animals falling in are speedily suffocated.

Of caverns of basaltic formation, and doubtless of volcanic origin, the most celebrated perhaps is the cave of Fingal, in the island of Staffa. It is composed entirely of basaltic rock. This curious cavern consists of a lava-like mass at the base, and of two ranges of basaltic pillars resting upon it. These support an irregular superimpending roof, and thus present a sort of architectural regularity. The breadth of the cave, at the mouth, is 53 feet, the height 117 feet. From the rock outside, the cave extends upwards of 370 feet.

'If this cave' (says Macculloch) 'were even destitute of that order and symmetry, that richness arising from multiplicity of parts, combined with greatness of dimension and simplicity of style,

which it possesses, still the prolonged length, the twilight gloom, half concealing the playful and varying effects of reflected light, the echo of the measured surge as it rises and falls, the transparent green of the water, and the profound and fairy solitude of the whole scene, could not fail strongly to impress a mind gifted with any sense of beauty in art or in nature, and it will be compelled to own it is not without cause that celebrity has been conferred on the cave of Fingal.'

A few years ago a most extraordinary cavern was discovered on the estate of Lord Kingsborough, at Coolagarranroe, in Ireland. The entrance is in the centre of a limestone quarry, and about four feet wide. From this there is a gentle descent of about fourteen feet to the first landing-place; and then, another descent of about twenty feet more. Here a large space opens to the view, about forty feet square, and nearly twenty feet high. But the interior of this curious excavation having been well described by a scientific visitor, who communicated the results of his observations to the 'Tipperary Free Press' soon after its discovery, we shall conclude by presenting an abstract of his account—'The rocks forming the arch over head are finely wild, pointed, and irregular. The next curiosity is the water hall, in which a variety of spars, in the form of shells, icicles, &c. may be seen. In the middle cave there are four crystallized pillars, extending from the floor to the top of the cavity, one of which could not be spanned by four men; one of those pillars (about five feet from the ground) branches off into three separate parts, but at the top it is one solid piece. Another of the pillars, in like manner, has an interstice in the middle, of four or five feet long, but it is one piece at the top and bottom. On touching these pillars with a cane they sound like bell metal; in this division also we find spars or stalactites interspersed in the most picturesque forms; one of them in particular is of a large size, and resembles a beehive. At a little distance farther on there is a solid piece of the same material, in the form of a table, which measures twelve feet by six in breadth, and near it there are three handsome pillars of a small size. The entrance to the upper or garret cave leads through a narrow passage between four pillars, where there is a large space about fifty feet square, and twenty high. The arching of this division is formed of rocks in their full dimensions, arranged in rude and terrible magnificence, and the spars are formed into large sheets resembling curtains and drapery extending from the top to the floor. On touching them with a stone or cane their sound is pretty clear. It is called the upper cave, because it is singularly placed higher than the one just mentioned. The cellar cave is so called from its low situation. In this division, at the right, there is a curious pillar—an immense solid spar as white as snow. Coming back to the cellar cave, you are carried to the brink of a precipice, where a new scene of astonishment presents itself—a rivulet is to be seen at the depth of twenty feet at least. This rivulet cannot be less than 100 feet from the surface or level of the quarry above. The lower cave, like the other divisions, is firmly arched with rocks, which in all probability are as old as time. In all the divisions or apartments of the cave, the stalactites and spars are moulded into varied and fantastic shapes. Some are formed like sugar-loaves — others like chandeliers, honey-combs, clusters of grapes, &c.; and beside all these, some specimens of the five orders of architecture may be seen rudely formed by the hand of nature.'

(Humboldt; Ansted; Milner; Russell's *Germany*, &c.)

CAWNPOOR (iv. 308). On the breaking out of the great rebellion in our East Indian territories, in the summer of 1857, Cawnpoor was besieged by the rebels under Nana Sahib, and eventually captured, when every European, including women and children, was ruthlessly butchered. The gallant General Havelock, however, succeeded in recapturing the place, and expelling the Sepoy rebels, who were defeated with considerable slaughter.

Cawnpoor is about 700 miles distant from Calcutta, and 50 from Lucknow. The Ganges is here about a mile broad in the rainy season, and half a mile in the dry months, but is never fordable. The town has of late years acquired some importance in the upper provinces of the Bengal presidency, and may be said to be strictly of European origin,—the old Hindoo town, which is situated near it, being a place of no importance. Upon the cession of the Doab, or the country between the rivers Ganges and Jumna, to the British in 1802, Cawnpoor was made one of the civil stations, and became the residence of the commercial and territorial collectors, and of the provincial judge. It is now the principal military station of the district, and extends for five miles along the banks of the Ganges. Among other important edifices it contains a theatre in the Roman Doric style, a military hospital, a new Protestant church, custom-house, jail, several handsome mosques, and commodious assembly-rooms. It has also a free school, which was established in 1823, with a revenue of 480*l.* per annum. It has manufactories of jewellery, saddlery, gloves, &c. The shops are large, and liberally supplied with European and other goods. The chief public promenade leads to a race-course, on which the troops encamp during the cool season of the year; the heat being too excessive, in the summer months, to admit of open exposure to the sun's rays.

CEBLEPYRI'NÆ (Gr. κίβλη the head, and πυρινὸς shining), in ornithology, one of the family of birds called Lanidæ, or butcher-birds, which live on caterpillars. [SHRIKES.] All the species is distinguished by the peculiar construction of the feathers on the back, which are very thick set, and when stroked upwards produce the sensation of little sharp spines being concealed below the surface.

CEDAR (i. 56—ABIES), so called from the brook *Cedron*, or Kedron, in Judæa. It is of the natural order Coniferæ, or pine trees, one species of which is much used in the making of black-lead pencils. The largest species are found on the mountains of Lebanon in Syria, and of

Nepaul in the East Indies. This noble evergreen has furnished the sacred writers with many striking metaphors. In the poetic style of the prophets, the cedars of Lebanon denote kings or potentates of the first rank. To break the cedars and tear up the masses on which they grow, is a figure used by David to express the majestic power of the Omnipotent. The wood of the cedar, from its fragrance and incorruptibility, has been employed in some of the most celebrated edifices of antiquity. Solomon's temple and palace were both constructed of this wood; and historians inform us that some of this timber was found in the temple of Apollo, at Utica, 2000 years old. Cortez, the Spanish chieftain, is said to have erected a palace at Mexico, in which were 7000 beams of cedar, many of which were 120 feet long, and 12 in circumference. Early travellers have stated that the cedars of Lebanon were so large that they rose to the height of 30 or 40 yards, and were sometimes from 35 to 45 feet in circumference. But the forest of gigantic trees, once so famous in the region of Lebanon, has now almost disappeared; some few only remaining to remind us of their former glory. It is not easy, however, to ascertain with correctness the girth of the largest cedar trees now in Lebanon. Mr. Maundrell, in his 'Travels,' tells us that one of them was 36 feet in circumference; while others have estimated the largest at 27 feet; yet the difference of girth must greatly depend upon the height from the ground at which the measurement is taken. Mr. Moorecroft, who surveyed the Ganges, says that he saw, on the Himalaya Mountains, cedars 22 feet in girth, at six feet from the ground. M. de la Roque, in his 'Voyage de Syrie et Mont Liban,' notices *twenty cedars*, the largest of which was 21 feet in circumference; and the whole extent of its branches formed a circumference of 120 feet. He informs us that the Patriarch of the Maronites (a Christian sect of Mount Lebanon), wishing to show his respect for a cedar forest celebrated in Scripture, pronounced canonical pains and excommunications against any Christian who should cut them. 'On the day of Transfiguration,' says M. de la Roque, the Maronites celebrate their festival under them 'with great solemnity; and they particularly honour the Virgin Mary, because she is compared to the cedars of Lebanon.' It is related by these Maronites, that the mountain snows have no sooner begun to fall, than these cedars—whose boughs are so equal in height that they appear to have been shorn—never fail to change their figures. The branches, which before spread themselves horizontally, rise insensibly, and turn their points upwards to heaven, thus forming altogether a pyramid. It is nature, say the natives, that inspires this movement, and makes them assume a new shape, without which these trees could never sustain the immense weight of snow that remains upon them for so long a period. It was to this wonderful vegetable *instinct*, if we may venture to call it so, that Southey so beautifully alludes, in his 'Thalaba:'—

'It was a cedar tree
That woke him from the deadly drowsiness;
Its broad round spreading branches, when they felt
The snow, rose upward in a point to heaven,
And standing in their strength erect,
Defied the baffled storm.'

M. Lamartine, in his delightful 'Travels,' makes some very interesting observations on cedars, and especially those of Lebanon and the East. 'These trees,' says he, 'are the most renowned natural monuments in the universe. * * * The Arabs of all sects entertain a traditional veneration for them. They attribute to them not only a vegetative power, which enables them to live eternally, but also an *intelligence*, which causes them to manifest signs of wisdom and foresight, similar to those of instinct in animals and reason in man. They are said to understand the changes of seasons; they stir their vast branches as if they were limbs, they spread out or contract their boughs, inclining them toward heaven, according as the snow prepares to fall or to melt. They are, in short, asserted to be divine beings under the form of trees. They grow upon the proudest site of the groups of Lebanon, and prosper above that point where all other vegetation expires.' Notwithstanding, it appears that these trees diminish in every succeeding age. Travellers formerly counted thirty or forty—more recently seventeen; and now, it is said, there are only seven. These, however, from their general appearance, may be fairly presumed to have existed in biblical history. 'Around these ancient witnesses of ages long past,' says Lamartine, 'which know the history of the world better than history itself,—which might tell us, if they could speak, so much of the creeds of human races long since vanished,—there still remains a little grove of yellower cedars appearing to me to form a group of four or five hundred trees or shrubs. Every year, in the month of June, the inhabitants of Beschierai, of Eden, of Kanobin, and the other neighbouring valleys and villages, climb up to these cedars, and celebrate mass at their feet.'

It appears from Evelyn, in his dissertation on 'Forest Trees,' that in 1664 the cedar was not cultivated in England; and we are told by Miller that the cedars in the Botanic Garden at Chelsea were planted in 1683. It has been stated that the finest collection in England is that planted by the Duke of Argyle, at Whitton, Middlesex, where there are about fifty trees, all above 120 years of age. The oldest cedar in this country cannot exceed 190 years, and the largest known are in girth from 28 to 30 feet. In the garden of the Earl of Pembroke at Wilton there is a magnificent collection of cedars, measuring in girth from 16 to 30 feet, which have been planted about 190 years, and are probably among the earliest in England. The large cedar tree at Hammersmith was measured by Lysons in 1795, and its girth was 10 feet 7 inches; in 1835 it had increased to 15 feet 4 inches, and now it is nearly 20 feet in circumference; so that its growth has been tolerably rapid. The Enfield cedar, supposed to have been planted by Dr. Uvedale in 1665, is about the same dimensions as the preceding, and is probably of the same antiquity as the Wilton cedars. Miller says that the largest of the two cedar trees at the Chelsea

Botanic Gardens, was planted in 1683, when it was three feet high. Sir J. Cullum says that in 1779 its circumference, when measured close to the ground, was 18¼ feet; but when measured at 5 feet from the ground, in 1835, it was found to be 14¼ feet in circumference; and now it is about 16 feet. In 1799, a cedar at Hendon, of great antiquity, was blown down by a violent gale, which was found on measurement to be 16 feet in girth at seven feet from the ground, and 70 feet in height. Such are the gigantic products of the vegetable world.

CEDRELA'CEÆ (Lat. *cedrus* the cedar tree), a natural order of exogens, of which the *cedrela* is the type, and so called from the wood having the aromatic scent of the cedar tree. This order consists of timber trees which are generally compact, beautifully veined, and pleasantly scented. The mahogany tree, belonging to this order, is a specimen.

CEL'ESTINE (Lat. *celestis* celestial, skyblue), a mineral of a delicate skyblue, yellow, grey, or reddish colour. It is the sulphate of strontia, and occurs in massive, fibrous, translucent, and crystallized shapes. The sulphur mines of Sicily produce some splendid specimens of this mineral. It also occurs in Scotland. Its consistent parts are 43·64 of sulphuric acid, and 56·36 of strontia. Its specific gravity is from 3·6 to 4.

CELTS, ancient copper instruments, resembling chisels, and so called from the presumption that they are of Celtic origin; for they are generally found in the different countries formerly inhabited by that primæval race. In France, where they are frequently met with, they are called *Gallic hatchets*. They are supposed to have been the heads of spears or battle-axes. Borlas has engraved one made of stone found in Cornwall, which very much assimilates to the flint hatchets of the Indians, and perhaps furnished the first idea of metal celts. (Borlase; Whittaker; Stukeley.)

CEMENTS (iv. 322). The chemistry of cement, or the law of cohesive affinity, is curious and interesting; and some knowledge of its practical application may be useful. That which is required for the joining of broken china, glass, metals, &c., is generally considered as the most serviceable. The materials for its preparation usually consist of quick-lime and white of eggs, or old thick varnish, tempered well together. But a still more effective material consists of gum mastich dissolved in as much spirit of wine as will preserve it liquid. In another vessel is dissolved as much isinglass, previously soaked in water, brandy, or rum, as will make two ounces of strong glue; to which a small quantity of gum galbanum or ammoniacum is added. The whole is then commingled by means of a sufficient heat. The mixture is kept in a phial, and, when wanted for use, softened in hot water. This has received the name of Turkey cement.

The glass-grinders prepare a cement by boiling pitch with fine-sifted wood-ashes, till it be of a proper temper, when a little tallow is added. For minute work they melt four ounces of resin with one ounce of bees'-wax, and four ounces of whiting made red hot.

For metals, glass, and precious stones, shell-lac is considered a good cement; but the metal should be sufficiently warm to melt it.

A good cement for Derbyshire spar and other stones, may be made with about seven or eight parts of resin and one of bees'-wax, melted together with a small quantity of plaster of Paris; when well mixed and nearly cold, the whole is kneaded together. Before the cement is applied the pieces to be joined must be heated.

The Japanese cement for tea trays, dressing boxes, &c., consists of rice flour mixed with cold water, and gently boiled. It is very adhesive, beautifully white, and almost transparent.

Such are the principal cements in use for domestic purposes; but the application of a cohesive material to effect the junction of stone, in many instances equal to the power of stone itself, is still more wonderful. Roman cement has long been known for its cohesive property; but there has recently been introduced a kind of Portland cement which far excels it. Its strength, when used as a mortar in brick and stone work, has been fully demonstrated. Thus two solid blocks were prepared, one of Roman and the other of Portland cement, and they were placed in such positions that weights might be suspended from each. The Portland cement maintained its cohesion until a weight of nineteen hundred pounds was applied to it; while the Roman cement gave way to a disruptive force of eleven hundred. At the recent Exhibition in Hyde Park, a brick beam was built up with Portland cement as a mortar. The bricks were hollow, and so ranged as to form a beam about four feet high; two ends of this beam rested on supports more than 20 feet asunder, and heavy weights were suspended from the centre. It was not until the amazing weight of nearly 70,000 lbs. was applied, that the beam could be disruptured.

CEM'ETERY, an area of ground, or extensive graveyard, for the interment of the dead, and for the erection of tombstones or monuments to their memory. Important changes have of late years been effected as regards public interments; and nearly all the old graveyards of the metropolis, which had been proved to be prejudicial to health, have been superseded by the almost general use of public cemeteries. According to the 'Cemeteries Clauses Acts' of 1848, 11 and 12 Vict., the General Board of Health were authorized to make inquiries as to the insalubrious state of any churchyard, and, where expedient, to prohibit interments, and frame plans for providing new burial-grounds for one or more parishes; such scheme to be presented to Parliament. Accordingly the 'Metropolitan Interment Act' of 14 and 15 Vict. contains provisions for the interment of the dead in and near the metropolis. By this Act, the Queen in council, on report of the General Board of Health, is authorized to order the discontinuance of interments otherwise than in the burial-grounds provided by the Act. An order in council, for the discontinuance of burials, may be made on the representation of the Secretary of State; and after such order, any burial contrary thereto (with

certain exceptions) is made a misdemeanor. Provisions are also made as to new parochial and other burial-grounds, and the management thereof by burial boards, &c. Hence, with very few exceptions, every graveyard in the metropolis is now closed against interments; and, in different parts of the suburbs, public cemeteries have been formed, either by private companies or at the expense of the respective parishes whose graveyards have been closed; and some of them are laid out in a very ornamental and tasteful manner, as at Highgate, Kensall Green, Finchley, Norwood, Abney Park, &c.

CENSUS of 1851.—We have already given an historical retrospect of the different periods at which the Census of Great Britain and Ireland were taken (iv. 326-30), and also comparative summaries of the results up to the year 1841. We now present a general synopsis of the important census of 1851.

England	16,921,888
Scotland	2,888,742
Wales	1,005,721
Islands in British Seas	143,126
Army, Navy, persons abroad ...	162,490
Total	21,121,967
Ireland	6,553,290
Total of the United Kingdom ...	27,675,257

The census was taken on the 31st of March, and showed an increase of nearly two millions and a half on that of 1841; the number of the inhabitants in Great Britain being 21,121,967. London has advanced with rapid strides. In 1841, the number of its inhabitants was 1,948,417; and in 1851, 2,362,236. In Ireland the results were very different, and for the first time in its history presented a retrograde appearance. The population which, in 1841, amounted to 8,175,000, had fallen, in 1851, to 6,553,290. Thus famine, and the wholesale emigration which it caused, have drained this portion of the United Kingdom of its inhabitants.

On a comparative review of the various returns for the last fifty years, we find that the population has nearly doubled itself; and statistical computations tend to show, on the presumption that the same rate of increase continues, that the population will double itself in fifty-two years and six months; thus amounting to 55,850,514 inhabitants in the United Kingdom.

In this brief review of the general census it will be necessary to explain, that under each county will be found the last population returns of all its principal towns arranged in alphabetical order, as well as the population of the county itself. Moreover, under the head of GREAT BRITAIN is inserted an alphabetical synopsis of the population of all the counties of England, Scotland, and Wales; and under IRELAND a similar classification will be found.

[GREAT BRITAIN, and IRELAND, and also the COUNTIES of each under their respective heads.]

The census of 1851 may be considered as the most complete and voluminous that has ever been published. The information is not confined to the simple population, but embraces a variety of matters connected with our social polity, of a most useful and interesting character. In order to collect this vast amount of information, there were employed, in England and Wales, 620 superintendant registrars, 2190 registrars, and 30,610 enumerators; in Scotland, 1010 superintendants, and 7873 enumerators; and in the British Islands, 257 enumerators. Seven millions of population forms were printed; and the weight of all the papers sent from the central office exceeded fifty-two tons. The whole work of collection was based on the new division of the country, made in 1834, for providing for pauperism. But it happens that the poor law unions are not always identical with parishes or counties. Hence has arisen, in many cases, the necessity of having two or more returns, one of the population in the counties, agreeable to their long-established boundaries, and another according to the boundaries of 1834. Different boundaries have also been established under the Municipal Acts, for electing members of Parliament; one for counties, and another for boroughs. These have given rise to numerous perplexities, and to various repetitions in the population returns. Thus, to give one example, Greenwich is returned in one place as containing a population of 99,365, and in another, as 105,784 persons; the one being its population as a poor-law union, and the other as a Parliamentary borough.

But to proceed to the general results of the census. We find that the number of towns in Great Britain, of various magnitudes, cities, market towns, and county towns, is 815, there being 580 in England and Wales, 225 in Scotland, and 10 in the Channel Isles. The villages, large and small, are 17,150 in number, and stand on an average two and a half miles apart. In these 815 towns the population amounted to 10,556,288, and that of the small towns without markets, with villages and detached residences, was 10,403,189; thus the population of town and country may be said to be equal. In the towns there were about five persons to an acre (5·2); while in the country there were about five acres (5·3) to each person. Hence the density in the towns was 3337 persons to a square mile; while in the country there were only 120 persons to the same space.

Of the inhabited houses in England and Wales, there were 334,094; of the uninhabited, 19,753; and building 873. To each house there were exactly five and a-half persons. Of the average number of children to each house, or rather family, the following computation has been made:—Out of 41,916 families (in the south of England), with a husband and wife at their head, there were 11,947 without any children at home; 8570 with one child at home; 7376 with two children each; 5611 with three children; 4027 with four children; 1275 with six children; and one family with twelve children. But two were found to be the average number of children to each family. Of 290,209 women (taken from the same counties) there were 169,806 wives, and 120,403 spinsters or widows.

Of the children 46,705 were born in wedlock; and 3292 were illegitimate. Ten were born to every thirty-six wives, and the same number to every 366 unmarried women. With relation to the proportion of males and females, some curious statistical details will be found under the head of GREAT BRITAIN.

With regard to emigration it appears that the total number of persons who emigrated from 1821 to 1851, was 2,685,742; there being, from 1821 to 1831, 274,317 emigrants; from 1831 to 1841, 717,913; and from 1841 to 1851, 1,693,516. The number of emigrants who left the port of Liverpool alone, during the year 1856, was 8448 more than the departures in the preceding year.

The following is a comparative view of the progressive increase of population, from 1801 to 1851, in some of the cities and principal towns in England.

	1801.	1811.	1821.	1831.	1841.	1851.
LONDON	958,863	1,138,815	1,378,947	1,654,994	1,948,417	2,362,236
Cambridge, City	10,087	11,108	14,142	20,917	24,453	27,815
CHESTER.						
Birkenhead	110	105	200	2,569	8,223	24,285
Chester	15,052	16,140	19,949	21,344	23,866	27,766
Macclesfield	10,613	14,582	21,034	30,408	32,629	39,048
Stockport	14,830	17,545	21,726	25,469	50,154	53,835
CUMBERLAND.						
Carlisle	9,415	11,476	14,416	18,865	21,550	26,310
Derby, Borough	10,832	13,043	17,423	23,627	32,741	40,609
DEVON.						
Devonport	23,747	30,083	33,578	34,883	33,820	38,180
Exeter	17,412	18,896	23,479	28,242	37,231	40,688
Plymouth	16,040	20,803	21,591	31,080	36,520	52,221
DURHAM.						
Gateshead	8,597	8,782	11,767	15,177	20,123	25,568
South Shields	11,011	15,165	16,503	18,756	23,072	28,974
Sunderland	24,998	25,821	31,891	40,735	53,335	67,394
GLOUCESTER.						
Bristol	61,153	71,433	85,108	104,408	125,146	137,328
Cheltenham	3,076	8,325	13,396	22,942	31,411	35,051
KENT.						
Chatham	12,940	15,787	19,177	21,124	24,269	28,424
Dover	8,028	11,230	12,664	15,645	19,189	22,244
Maidstone	8,027	9,443	12,508	15,790	18,086	20,801
LANCASTER.						
Ashton	6,391	7,950	9,222	14,035	22,678	29,791
Blackburn	11,980	15,083	21,940	27,091	36,629	46,536
Bolton	17,966	24,799	32,045	42,245	51,029	61,171
Burnley	3,918	5,405	8,242	10,026	14,224	20,828
Bury	9,152	11,302	13,480	19,140	24,846	31,262
Liverpool	82,295	104,104	138,354	201,751	286,487	375,955
Manchester	94,876	115,874	161,763	237,832	311,269	401,321
Oldham	21,677	29,479	38,201	50,513	60,451	72,357
Preston	12,174	17,360	24,859	33,871	50,887	69,542
Rochdale	8,542	10,753	14,017	19,041	24,272	29,195
Warrington	11,321	12,682	14,822	18,184	21,116	23,363
Wigan	10,989	14,060	17,716	20,774	25,517	31,941
LEICESTER.						
Leicester	17,005	23,453	31,036	40,639	50,806	60,584
NORFOLK.						
Norwich	36,238	36,748	49,705	60,505	61,846	68,195
Yarmouth	16,573	20,448	21,007	24,535	27,865	30,879
NORTHAMPTON.						
Northampton	7,020	8,427	10,793	15,351	21,242	26,657
NORTHUMBERLAND.						
Newcastle	33,048	32,573	41,794	53,613	70,337	87,784
Tynemouth	13,171	17,548	23,173	23,206	25,416	29,170
NOTTINGHAM.						
Nottingham	28,801	34,030	40,190	50,220	52,360	57,407
OXFORD.						
Oxford	11,694	12,931	16,364	20,649	24,258	27,843
SOMERSET.						
Bath	33,196	38,403	46,700	50,800	53,196	54,240

	1801.	1811.	1821.	1831.	1841.	1851.
SOUTHAMPTON.						
Portsmouth	33,226	41,587	46,743	50,389	53.032	72,096
Southampton	7,913	9,617	13,353	19,324	27,744	35,305
STAFFORD.						
Stoke-upon-Trent	23,278	31,557	40,237	51,589	68,444	84 027
Walsall	10,399	11,189	11,914	15,066	19,857	25 630
Wolverhampton	30,584	43,190	53,011	67,514	93,245	119,748
SUFFOLK.						
Ipswich	11,277	13,670	17,186	20,201	25,384	32,914
SUSSEX.						
Brighton	7,440	12,205	24,741	41,994	49,170	69,673
WARWICK.						
Birmingham	70,670	82,753	101,722	143.986	182,922	232,841
Coventry	16,034	17,923	21,448	27,298	31,032	36,812
WORCESTER.						
Dudley	10,107	13,925	18,211	23,430	31,232	37.962
Worcester	11,460	13,814	17,023	18,610	27,004	27,528
YORK.						
Bradford	13,264	16,012	26,307	43,527	66,715	103,778
Halifax	12,010	12,766	17,056	21,552	27,520	33,582
Huddersfield	7,268	9,671	13,284	19.035	25.068	30,880
Hull	29,580	37,005	44,520	51,911	67,308	84,690
Leeds	53,162	62,534	83,796	123,393	152,074	172,270
Sheffield	45,755	53,231	65,275	91,692	111,091	135,310
Wakefield	10,581	11,393	14,164	15,932	18.842	22,057
York	16,846	19,099	21,711	26,260	28,842	36,303
GLAMORGAN, in Wales.						
Merthyr Tydfil	10,127	14,945	20,959	27,281	43,031	63,080
Swansea	10,117	11,963	14,896	19,672	24,604	31,461

We shall close this article with a statistical abstract of the Registrar-General's Metropolitan returns for 1856. It appears that during the fifty-two weeks ending Dec. 27, 1856, the number of children born in London was 86,833. The males exceeded the females; there being 44,159 boys, and 42,674 girls. In the same period the deaths were 57,786; of which 28,894 were males, and 28,892 females. Thus the number of deaths in 1856 was less than that of any previous year since 1852. For the year 1857, it is assumed that sustenance, clothing, and house accommodation, may be found in London for about 60,000 inhabitants more than it contained at the end of 1855, and that the entire population is about 200,000 more than at the census of 1851.

CENTRAL FIRE, a term applied to the heat which is found to exist in the interior surface of the earth, independently of the variable heat of the sun. In all climates and in all countries, the heat at a certain depth (say from one to two hundred feet) is constantly the same; and this arises from a source peculiar to itself. This heat, which is uniform and perpetual, is at least seven or eight times as great as that produced by the presence of the sun when irradiating the earth's surface. Various theories have been advanced for the solution of this problem. Some philosophers have asserted that this internal heat is merely the effect of the continual effervescence caused by the mineral waters inclosed in the bowels of the earth, where they meet and become mingled with each other. These philosophers notice the effects produced by the commixture of iron and vitriolic acid, both of which are abundantly diffused throughout nature. These, say they, are the causes which excite and maintain, in the bowels of the earth, that perpetual fire by which its heat is preserved, and which frequently manifests itself in the eruptions of volcanoes existing in different parts of its surface. Other philosophers have maintained that the central heat is nothing more than that heat which the body of the earth, perpetually warmed by the rays of the sun, has received from the influence of that luminary. Thus in a long succession of ages, say they, the heat has been communicated to its interior parts; and this is what they designate the *central fire*. Yet it is difficult to conceive that the solid mass of this globe, if originally destitute of heat, could ever acquire that internal heat which it appears to possess, by mere exposure to the sun. The comparatively small influence of the solar beams, would, in some measure, be neutralized by the radiation of heat from the earth's surface. The celebrated philosopher, Buffon, has advanced another theory. He says that the earth and the circumsolar planets were formerly a part of the sun, and detached from its surface by the violent collision of a comet, which projected these massy fragments to various distances; and each of them, while in a state of fusion, assumed a globular form, agreeably to the laws of gravitation and rotatory motion. They then passed from a state of fusion to that of solidity, and long remained impregnated with a quantity of fire, which ren-

dered them uninhabitable. In the course of ages, however, their surfaces gradually cooled, until they acquired a degree of heat necessary for animal life, and for the purposes of vegetation. Hence Buffon inferred that the interior parts of the earth would still continue to possess a greater degree of heat than the surface, and that this heat would be in proportion to its distance from the centre. This, in reality, corresponds with our ideas of central heat, as supposed to exist in the bowels of the earth. The gradual diminution of heat in the massy substance of the globe cannot, however, be satisfactorily proved. That there is an internal heat is demonstrated by the existence of more than 200 active volcanoes, and from the crystalline rocks produced by the agency of subterranean fire.

From these appearances, geologists, notwithstanding their early prejudices, have been induced to admit the agency of fire in the production of primitive rocks, and in the modifications of the earth's surface. Astronomers have also advanced an ingenious theory, or rather hypothesis, that the now solid planetary bodies were once in a state of gaseous fusion as nebulous matter, and were gradually condensed into their present state. A liquid body exposed to the united action of gravity and a projecting rotatory impulse, as they properly aver, would necessarily assume the oblate spheroid form of our globe. Whatever may be the cause, it is certain that the appearances presented by rocks, in every part of the globe, support the supposition that the interior of the earth has a much higher temperature than its superficies, although that temperature may have long been on the decrease.

From the partial observations which have been made on the temperature of mines, it is positive that the heat increases from the surface downwards. Numerous observations have been made in various counties at depths varying from 120 to 1800 feet; and from these M. Cordier has demonstrated that the subterranean temperature increases with the depth. From experiments made beneath the observatory at Paris, it has been deduced, that a depth of fifty-one feet corresponds with an increase of one degree of heat. Hence, it follows, if we admit a similar continued increase, that the temperature of the rocks, at a depth under the city of Paris of about a mile and a half, would be equal to that of boiling water. The same results, however, are not obtained in all places; for we have a variety of depths, varying from 24 to 100 feet, which all equally show an increase of one degree in temperature. The mean increase of temperature is calculated to be a degree for every 46 feet, and hence it follows, if the same ratio continues, that at the depth of about 60 miles there is a temperature sufficient to fuse any rock now known; and that at the earth's centre the temperature would be equal to 450,000° of Fahrenheit. But many more experiments will be necessary before we can arrive at any satisfactory results. We are at present only on the threshold of physical investigation; and it will require a considerable time to solve this interesting problem. Two things, however, are clearly determined—the increased subterranean temperature of the earth's surface according to the depths, and the variation of heat in different parts of the globe.

(Buffon; Ozanam; M. Cordier; Higgins, &c.)

CENTRI'NA (Gr. *κέντρον* a thorn or spur), a genus of fishes, of the family Squalidæ, with thick bodies and strong dorsal spines situated in the fleshy part of the fins.

CENTROLEP'IS (Gr. *κέντρον* a prickle, and *λεπὶς* a scale), a genus of plants belonging to the Bristle-worts. There are also various genera, which are so called from their prickly nature, and compounded of the word *kentron*; as *Centrolobium* (prickle-lobed), a genus of leguminous plants of the tribe Dalbergeæ;—*Centronia*, a genus of the order Melastomaceæ, with large purple flowers;—*Centropetalum* (prickle-petalled), a genus of the order Orchidaceæ;—*Centropogon* (prickle-bearded), a genus of the order Lobeliaceæ;—*Centrospermum* (prickle-seeded), a genus of composite plants, of the sub-order Seneciomidæ;—and *Centrostemma* (prickle-stemmed), a genus of the order Asclepiadaceæ.

CENTROL'OPHUS (iv. 338), (Gr. *κέντρον* a prickle, and *λόφος* a crest), a genus of fishes, of the family Coryphænidæ, with elongated bodies; the dorsal fin commencing even with the pectoral, and the ventral fin small. There are also various genera of fishes, compounded from the same word; as *Centronotus* (spine-backed), a genus of the family Zeidæ, with oblong fusiform bodies, and minute scales; the dorsal and anal fins being of equal length, and falcated;—the *Centriscus*, a genus of Acanthopterygious fishes, belonging to the family Fistularidæ;—the *Centrophorus*, a genus belonging to the family Squalidæ, and resembling the Spinax, the body being covered with prickles or scales;—the *Centropoma* and *Centropristis* (saw-like spines), genera belonging to the Percidæ or Perch family.

CENTURIA'TA (Lat. *centum* a hundred), an important division of the Roman people, frequently mentioned by Latin writers. This classification, which was chiefly of a military character, is attributed to Servius Tullius, the sixth king of Rome. He divided all his people into six classes, and each class was subdivided into centuries (*centuriata*), or hundreds of men, with different arms or liveries, according to the value of their estates. The first class comprehended eighty centuries, and included the senators, and all those whose estates amounted to 1,100,000 *asses*. The second, third, and fourth classes consisted each of twenty centuries; the estates of each class being seventy-five, fifty, and twenty-five thousand *asses*. The fifth class contained thirty centuries, and consisted of artizans and mechanics, whose incomes were equal to 11,000 *asses* each. The last, the lowest, and the most numerous class, were the *capite censi*, who consisted only of one century; and being mere paupers, they were so called because they were classified by their *heads*, and not by their estates. All who were of the first class were called *classici*, by way of distinction; hence arose the application of the term to writers of the first *class*.

CEPHAL'EPIS (Gr. κεφαλὴ a head, and λεπὶς a scale), a genus of fishes of the family Gymnetres, with very long thin bodies, and two dorsal fins extending the entire length of the body.

CEPHA'LIA (Gr. κεφαλὴ the head), a genus of dipterous insects, of the tribe Musides.

CEPHALI'NÆ, a sub-family of fishes (Sunfishes), of the order Plectognathes, with orbicular or oval bodies. *Cephalus* is the type of the family.

CEPHALOCE'RA (Gr. *horn-headed*), a genus of dipterous insects, of the family Nemocera, with a long proboscis projecting like a horn.

CEPHAL'OPHUS (Gr. *crest-headed*), in zoology a genus of Ruminants, of the family Antilopidæ (Antelopes), all distinguished by a conspicuous tuft of hair on the forehead.

CEPHALOP'TERA (Gr. *wing-headed*), in ornithology a genus of the Coracinæ, and the family Corvidæ (Fruit-crows), distinguished by an enlarged crest of feathers on the head.

CERATO'DES, a sub-genus of Mollusca, of the family Turbidæ, in which the operculum is horny, and the shell discoidal.

CERCOPI'NÆ, a family of the small songless grasshoppers, or jumping Cicadas, which are found in great abundance in verdant situations. The frothy substance often found in the axils of grasses, and vulgarly called Cuckoo-spit, is produced by the larvæ of these insects. The species are very numerous.

CEREA'LIA, ancient festivals celebrated in honour of Ceres, the goddess of harvest. They were held in the greatest honour at Rome, where they were first instituted by the Ædile Memmius; but after the disastrous battle of Cannæ they ceased to be celebrated.

CEREPHA'SIA (Gr. *horn-like*), a genus of Mollusca, of the sub-family Melaianæ, with a univalve cerithiform shell.

CERITH'IUM, a genus of pectini-branchiate Gasteropods, of the family Strombidæ, and sub-family Cerinthinæ.

CE'ROLITE (Gr. *wax-stone*), a mineral, of a yellow, white, or green colour; and consisting of silica, 37·95; *magnesia*, 16·02; alumina, 12·18; water, 31·00. It *is* found in laminar and compact masses. Specific gravity, 2·2.

CESTUS, a sort of gauntlet, or iron glove, used in the athletic games of the ancients. [ATHLETÆ, *Suppl.*] They were worn by the Athletæ, in their contests with the Pancratiasts, or with each other, and were of the most deadly character. For the sake of adding power to the blows, the glove was filled with lead or iron. A Roman cestus, which was found on the arm of a cestophorus at Herculaneum, is a glove formed with fingers only to the nails, and cleft in the hand. (Adam's *Roman Antiq.*)

CHÆTOBLEM'MA (Gr. *bristle-faced*), a genus of birds belonging to the tribe Dentirostres, and so called from the front of the head being defended by thick-set bristly feathers.

CHÆTODER'MIS (Gr. *bristle-skinned*), a genus of cheliform fishes, of the order Plectognathes, and family Balistidæ; the body is entirely covered with sharp prickles, mingled with soft ciliæ.

CHALISO'MA (Gr. *pebble-bodied*), a genus of fishes, of the order Plectognathes, and family Balistidæ, in which the second dorsal and anal fins are falcated; and the caudal fin large and doubly lunate.

CHALK'OLITE (Gr. *chalk-stone*), a green coloured mineral, crystallized in quadrangular prisms in 4, 6, and 8 sided tables. Specific gravity, 3·33.

CHANG-CHOW, a large city of China, about thirty miles from Amoy, in the important province of Foo-kien. It contains upwards of 800,000 inhabitants, and this independently of the suburbs. The streets are perpetually crowded and in full bustle, which shows the thickness of the population, and the extensive business transacted. The shops are numerous and elegant, and well stocked with goods. Even the bridges over the river are covered with shops and cooking stalls. The temples are large, and spacious grounds are attached to them. They have every appearance of great antiquity, and are said to be 1000 years old. Some of the idols are of gigantic size, about sixteen feet high, and cut out of solid granite. (Montgomery Martin's *China.*)

CHAOS, a term used by the ancient philosophers, poets, and cosmogonists, to express the confusion which overspread matter in its first state of existence, and before the Omnipotent, by his Almighty fiat, had reduced it to order. The term is borrowed from the Greek Mythology (Hesiod, 'Theog.' 116; Ovid, 'Met.' i. 5); and Grotius ('De Verit. Chr. Rel.') has remarked on the striking similitude in the Pagan Mythologies and the Book of Revelation. Thus chaos is usually represented as a rude and undigested mass of atoms, surrounded by a dark and turbid atmosphere, 'quem dixere Chaos,—rudis indigestaque moles' (Ovid). Chaos being the oldest and first principle of universal nature, the world was supposed to be created and reduced to order out of its incongruous particles, by the great Creator of all things,—'Magni speciem glomeravit in orbis.' Thus the origin of the world is universally attributed by Phœnicians, Egyptians, Persians, and Greeks, to a rude and unconglomerated mass of matter called Chaos. The Platonic and Ionic philosophers taught the same doctrines; and the first chaos is mentioned by Hesiod, Orpheus, Menander, and nearly all the Greek and Latin writers. In the doctrines of the Stoics there may be some philosophy. After admitting that the world was first made out of chaos, they taught that it would at last be reduced to chaos; and that, in the meantime, its great periods and revolutions were only transitions from one state of chaos to another.

CHAPOO, a large port and city of China, situated on the northern side of the great bay of Hang-chew, in the province of Che-keang. It has a considerable trade with Japan, and is a place of great mercantile importance. It is surrounded by a wall; and the inhabitants appear to possess many of the comforts, and even the elegancies of life. In 1730, the Emperor

Yang-ching devoted much attention to the defences of the place, and provided it with a regular armoury, and about 30,000 fighting men. During the late war with China, the British troops took possession of the city, when they found that the Tartar troops, as in all the great towns of China, had a particular portion of the city allotted to themselves. (Montgomery Martin's *China.*)

CHARIOT RACES. Of all the different public games in which the ancients indulged, that of the chariot race was held in the greatest estimation. The racing chariots were generally of a lighter construction than those intended for war. They were drawn by two, four, or more horses, ranged abreast. The charioteers and those engaged in the races were usually men of most exalted rank. It was to princes and heroes that chariots, either in war, or at the public games, were entrusted. Hence arose that laudable emulation among the heroes of classical antiquity to excel others in this manly art. Thus it was that all those who presented themselves at the Olympic games, to dispute the prize in the chariot race, were persons pre-eminent for their rank, wealth, or heroism. Kings themselves engaged in these contests, and we find that ancient medals and sculptors are often inscribed with the victor's names. Philip of Macedon appeared as much gratified with his victories at the games, as if they had been gained over an enemy, and had them stamped upon his medals and coins. Alcibiades brought seven chariots to the public games, by which he carried off the first, second, and third prizes. Euripides celebrated these victories in an ode, of which Plutarch has preserved a fragment. It appears, from several passages in Pindar, that the chariots ran twelve times round the Stadium; and he that came in the first, in the *twelfth round*, was proclaimed the victor. The great art was that of being able to take the best ground at the turning of the boundary,—'Metaque fervidis evitata rotis;' for if the charioteer drove too near it, he was in danger of being dashed to pieces, and if he kept two feet wide of it, his nearest opponent might dash between him and the boundary, and thus gain the victory. The Romans were so passionately fond of these chariot races, that they at length became divided into dangerous factions, in which the emperors joined, of which Juvenal, in his Satires, makes mention. It appears there were four parties, known by their different colours—green, red, white, and blue. The spectators generally favoured one or other of these factions, as caprice or humour dictated. In the reign of Justinian they had arrived at such an alarming height, that in Constantinople a dreadful tumult arose, when no less than 30,000 persons lost their lives. (Nuttall's *Class. Dict.*)

CHARIOTS OF WAR (iv. 414). The Grecian chariots are the most familiar to classical readers. They were usually drawn by two horses abreast, and were richly embossed and adorned. Every chariot carried two men, the driver and the warrior, as we read in Homer; and sometimes they were armed with hooks and scythes, with which terrible havoc was sometimes caused. But as the science of war improved, these chariots lost their importance. Various methods were invented to render them useless. Sometimes, by a shower of darts, or by the shouting of the whole army, the horses became terrified and unmanageable, and did more mischief to their masters than to the enemy. It was thus that the Romans, under Sylla, at the battle of Cheronæa, defeated and put to flight the enemy's chariots; at the same time raising loud peals of laughter, and ironically shouting after the flying foe, to send them some more. (Plut., Livy.) There was a kind of chariot, called *Covinus*, used by the Gauls, Germans, and Britons, which was armed with scythes; it was adopted by the Romans before the period of Domitian. Dr. Whittaker has given a British car from the coins of Cunobelin.

CHARLES, LOUIS JOHN JOSEPH, ARCHDUKE, second son of the Emperor Leopold II. of Austria, and a field-marshal of the empire. The name of Archduke Charles is associated with nearly all the important movements and great battles in which his countrymen were engaged during the eventful career of Napoleon Bonaparte. He was a soldier by profession, and often displayed the first requisites of a general; but it was his misfortune to be opposed to the greatest captains of the age, and hence arose the innumerable difficulties which he had to encounter during his long military career. He was born in 1772; and became a soldier at a very early age. In 1795 he was appointed to the command of the Austrian army on the Rhine, where he entered into collision with the French armies, and defeated Generals Jourdan and Moreau. He was afterwards called into Italy to repair the disasters of the Austrian generals; and such were his military talents, that he elicited the approbation of Napoleon himself. On the rupture of the peace of Campo Formio, he was again placed at the head of the armies on the Rhine. The Russian armies having been annihilated by Massena, the court of St. Petersburg attributed all the blame to Archduke Charles, and he was recalled from his command; but, after the battle of Hohenlinden, the court of Vienna was glad to recall him. At the peace of Lunéville he was appointed minister of war, and, in that position, he undertook the re-organization of the Austrian army, which, under his supervision, attained a state of perfection previously unknown. On the Austrians taking the field against the French in 1805, he was again sent to Italy; but, after the battle of Austerlitz, so fatal to the allied armies, he was again recalled. Although he did all in his power to prevent the Austrians coming into collision with the French, his efforts were unsuccessful; and Austria, whose armies he then commanded, had to suffer the disastrous defeat of Wagram. This was, in fact, the last effort of his military career. In 1809 he retired from active service, when he produced some strategic works, which have been much approved by military men. He died in 1847.

CHATEAUBRIAND, FRANCOIS AUGUSTE, VISCOMTE DE, Peer of France, and Member of the Institute. He was born at St.

Malóes in 1769, and, like many others, whom the great movements of the French revolution called into active life, he was destined to play a prominent part in the gigantic labours of the last generation. In his seventeenth year, after passing through the general routine of a liberal education at Rennes, he entered the regiment of Navarre as sub-lieutenant. In 1789, animated by a love of adventure, he went to America, where he spent two years in all the wildness of savage life. But accidentally meeting with a newspaper, which revealed to him the momentous changes then taking place in his own country, he determined on returning, and then he entered into the busy scenes of the French revolution. At the siege of Thionville, in 1792, he was wounded, and conveyed, in a dying state, to Jersey. On his recovery he was obliged to fly to England, where he was exposed to great privations, and gained a bare subsistence by his literary labours. Here he brought out his first work, in 1797, entitled, 'Essai Historique et Politique sur les Revolutions Anciennes et Modernes.' After the revolution of the 18th Brumaire, he returned to France; and in 1801 published his 'Attila,' which was followed, in 1802, by his most celebrated work, the 'Genius of Christianity.' At this time he appears to have been patronized by Napoleon; for soon after his publication of 'Attila' he received the appointment of secretary to the French embassy at Rome; and in 1804, he was nominated minister plenipotentiary to Switzerland. But on learning the melancholy fate of the Duc d'Enghien he threw up his appointment, and rejected all the overtures made to him by Napoleon. In 1807 he published his 'Martyrs,' and in 1811, his 'Itinerary from Paris to Jerusalem.' At the restoration of the Bourbons, in 1814, he again entered into active life, and was unceasing in his efforts on behalf of the restored family. He was one of the principal advisers of Louis XVIII.; and in 1815 was created a peer of France. In 1816 he was elected a member of the French Institute. A publication which he brought out at this time, entitled 'Monarchy according to the Charter,' gave great umbrage to the Court; but in 1820 he appears to have been restored to favour; for he was appointed ambassador at Berlin, and subsequently, in 1822, he was sent as ambassador to the court of St. James's. He next became Minister of Foreign Affairs, when he organized the invasion of Spain under the Duke d'Angoulême. In the Congress of Verona, the proceedings of which he has recorded, he took a prominent part. In 1828 he was sent as Ambassador to Rome; but on the formation of the Polignac administration, in 1829, he resigned his office. After the revolution of 1830, he may be said to have taken leave of politics, at least so far as his active services were concerned; but he continued to issue the bitterest invectives against the governments of Louis Philippe, which eventually led to his arrest as a suspected person, though he was soon discharged by the authorities. His latter years were spent in comparative obscurity; although he continued to devote himself occasionally to literary pursuits. In addition to his other works he produced an 'Essay on English Literature,' 'Etudes Historiques,' and numerous brochures on political and historical matters. He died at Paris in 1848, aged 80.

CHEIROTHE'RIUM (iv. 451), (Gr. *χεὶρ* the hand, and *θήριον* a wild beast), *in geology*, the name of an animal, whose foot-prints, resembling those of a human hand, have been found impressed on the new red sandstone formation both in England and on the Continent. From the peculiar labyrinthian structure of its teeth, Professor Owen has named it the Labyrinthodon. He supposes it to have been a large batrachian reptile.

RESTORED FIGURE OF THE CHEIROTHERIUM OR LABYRINTHODON.

'The new red sandstone (says Professor Ansted) was long remarkable as the rock which contained the first distinct proofs of the existence of large air-breathing animals. At first the evidence of this was confined to foot-prints in the sand rock, supposed to have been made by birds and reptiles; but since then the actual bones of many reptiles have been found, and any doubts that may have existed on this subject are finally set at rest. The Labyrinthodon (or Cheirotherium) affords remarkable proof of the general correctness of the first impressions of competent naturalists on this head. Footmarks, at least, have been detected, which it is scarcely possible to refer to other animals. Besides the batrachian or frog-like labyrinthodon, of which there are indications of several very different varieties, the new red sandstone also contains remains of turtles and of other reptiles of curious form from South Africa.'

At a recent sitting of the Academy of Sciences of Paris, it was stated that in a quarry of the red sandstone formation at St. Valbert, near Plombières, in the department of the Haute Saône, traces of the footsteps of this antediluvian animal have been discovered, which are exactly similar to those found some years ago near Hildburghausen, in Germany, of which Baron Humboldt has given a description.

CHELA (Gr. *a claw*), a genus of fishes belonging to the Salmon family, and the sub-family

Cyprinæ. The mouth is very small, and opens vertically.

CHELO'NE (Gr. χελώνη a tortoise), a form of battle adopted by the Greeks when attacking fortified places. It was similar to the *testudo* of the Romans, and served to protect the besiegers during their approach to the walls. The soldiers placed their shields over their heads in a sloping position; the first rank standing erect, the second and third stooping a little, and the last rank kneeling. They thus assumed the form of a tortoise's back; and were protected from the missiles of the defenders.

CHELSEA HOSPITAL, a great national asylum, situated on the banks of the Thames, and founded by Charles II. in 1682, for the benefit of decayed and maimed soldiers. On the death of Charles the building was carried on by his brother James, and completed, in 1690, by William and Mary, at an expense of 150,000*l*. The edifice was designed by Sir Christopher Wren; but the honour of projecting the establishment is ascribed to Sir Stephen Fox, who largely contributed towards its foundation. The building consists of a fine and extensive quadrangle, open on the river side, with a bronze statue of its founder in the centre. The extent of the premises and grounds attached thereto, is about fifty acres. The whole length of the building, from east to west, is 790 feet; and the two wings are each 365 feet in length. In these wings are sixteen wards, which afford accommodation for four or five hundred pensioners. There are, besides, in the other buildings, a considerable number of apartments for officers and servants. These pensioners consist chiefly of superannuated veterans, who have been at least twenty years in the army, or those soldiers who have been disabled in the service. They are divided into different companies, and perform a kind of garrison duty. Board and lodging, clothes, washing, and eighteenpence a week are allowed to each pensioner. The infirmaries are kept remarkably clean, and are supplied with hot, cold, and vapour baths. The annual expense of the house establishment, including officers' salaries, &c., amounts to about 30,000*l*. per annum.

Besides the regular in-pensioners there are numbers of out-pensioners, the extent of which is not limited by any law. Of these, the private soldiers receive fivepence per day, and the sergeants (about 400 in number) one shilling; their half-year's pension being always paid in advance. With the exception of a small poundage on the pay of the household troops, this establishment is supported by annual parliamentary grants.

Connected with the hospital is the Royal Military Asylum, a noble establishment, founded in 1801, for the education and maintenance of the children of soldiers.

(*Military Encyclopædia.*)

CHEMICAL ACTION, a term used in chemical language to express the phenomena attendant on the union or decomposition of substances; and the leading feature characterizing such action is, that the combining substances lose their original properties, and acquire new ones. This change of property is, however, occasionally inconsiderable, for when water is mixed with sulphuric acid, the character of the two constituents remains so little changed, that there is no difficulty in recognising their presence. It is, however, of more general occurrence, that the bodies, which, prior to combination or decomposition, were possessed of certain specific characters, entirely lose them on entering into fresh combinations, acquiring properties specifically distinct from those they formerly possessed. For example, if powdered sulphur and copper filings be made to unite together by the aid of heat, an entirely new substance appears (a sulphuret of copper), which compound is possessed of properties quite different from those of its elementary constituents. When sulphuric acid is neutralized with caustic soda, a sulphate of soda is formed, which is a neutral salt. A compound which has no action on vegetable colours is harmless when taken internally, and is frequently used as a purgative. The ingredients, however, used to produce this compound, are possessed of very different characters, the sulphuric acid being highly corrosive, reddening vegetable colours, and intensely sour; the soda, highly caustic, alkaline, and changing the blue colour of vegetables to green. Phenomena frequently attendant on chemical action are—changes of form, temperature, density, and colour.

There is a great variety in the changes of form attendant on chemical action. By combination, gaseous bodies are converted into liquids or solids; for example the two gases oxygen and nitrogen, which in a state of mechanical mixture constitute the air we breathe, when in a state of chemical combination produce aqua-fortis or nitric acid, one of the most energetic of chemical agents. Ammoniacal and hydrochloric acid gases unite to form the solid known as sal ammoniac, or muriate of ammonia. Again, solids are frequently converted into gases, as when gunpowder is exploded; and it is this sudden evolution of gaseous matter that gives rise to the explosive force of this agent. A solid may be also produced from two liquids, as when sulphate of baryta is formed on the addition of sulphate of soda to chloride of barium; the two latter salts are readily soluble in water, but when their aqueous solutions are mixed, a new salt is formed by their decomposition, which is insoluble, and therefore assumes the solid form. The term precipitation is given to this class of chemical phenomena.

A change of temperature is often attendant on chemical action. When oil of vitriol is mixed with water, a great rise of temperature is produced, the effect of the combination of two liquids with a diminution of bulk, without change of form. When water is added to quick lime, in the process known as slaking, great heat is also produced, owing to the combination of the water with the lime, and its conversion into a solid state, namely, a hydrate of lime.

When two bodies combine together it rarely happens that the compound formed occupies the same bulk that the bodies which have united to produce it did previous to their combination.

When oxygen and hydrogen are united by the electric spark they combine to form water, the space occupied by which bears no comparison with that required by the two elementary bodies previous to their union. If an ounce by measure of oil of vitriol be mixed with an equal bulk of water, the mixture will be found to measure considerably less than two fluid ounces.

Change of colour is frequently the result of combination or decomposition. When iodine and mercury are triturated together with a little spirit, they unite to form the biniodide or iodide of mercury: according to the proportion of the substances, the iodide becomes a green powder, which when sublimed crystallises in beautiful orange yellow plates, and the biniodide a red powder, converted by sublimation into a beautiful crimson coloured compound.

Many colourless salts, when dissolved in water and mixed, produce coloured precipitates; as the yellow iodide of lead from iodide of potassium and acetate of lead; scarlet biniodide of mercury from iodide of potassium and corrosive sublimate or bichloride of mercury, &c.

A striking instance of chemical action, and the production of a change of colour, is afforded in the decomposition of many acids by metals, when effervescence ensues, the result of the extrication of a gas, and a salt of the metal is formed. For instance, when copper is dissolved in nitric acid, nitric oxide gas is evolved by the decomposition of the nitric acid, and a nitrate of copper is formed of a fine blue colour.

CHEMISTRY (iv. 453-9). The advantages which the arts have derived from chemical discoveries, and the important uses made thereof in the present age, are almost incalculable. Dr. Lyon Playfair, in one of his lectures delivered at the Society of Arts, pointed out the various chemical metamorphoses to which everything is exposed, even in the most ordinary walks of life. Chemistry, like a prudent housewife (says he), economizes everything. 'The horse shoe nails dropped in the streets during the daily traffic are carefully collected by her, and re-appear in the forms of swords and guns. The clippings of the travelling tinker are mixed with the parings of horses' hoofs from the smithy, or the cast-off woollen garments of the poorest inhabitant of a sister isle; and soon afterwards, in the form of dyes of the brightest hue, grace the dress of courtly dames. The main ingredient of the ink with which I now write was possibly once part of the broken hoop of an old beer barrel. The bones of dead animals yield the chief constituents of luciter matches. The dregs of port-wine, carefully rejected by the port-wine drinker in decanting his favourite beverage, are taken by him in the morning, in the form of Seidlitz powders, to remove the effects of his debauch. The offal of the streets and the washings of coal-gas re-appear carefully preserved in the lady's smelling bottle, or are used by her to flavour blanc-manges for her friends. This economy of the chemistry of art is only in imitation of what we observe in the chemistry of nature. Animals live and die; their dead bodies, passing into putridity, escape into the atmosphere, whence plants again mould them into forms of organic life; and these plants, actually consisting of a past generation of ancestors, form our present food.'

CHEROPOTAMUS (Gr. a *river-hedgehog*), in geology, an extinct genus of the thick-skinned Mammalia, supposed to form a link between the peccary and the anoplotherium.

CHERUB (plural CHERUBIM), a word frequently used in the Old Testament to denote a peculiar order of angels, but frequently signifying certain symbolical figures with one or more heads, and furnished with wings. We read of two of them standing face to face on the lid of the mercy-seat of the ark of the covenant in the Holy of Holies, which they overshadowed with their wings. Among the Egyptians similar figures appear to have been made use of in the celebration of their religious mysteries. The form and design of these figures have given rise to various conjectures, and have evoked much learned discussion among scholars of both ancient and modern times. Josephus observes that they were extraordinary creatures, of a figure unknown to mankind. Grotius says they were like a calf, and Bochart thinks they were nearly the figure of an ox. The descriptions which the Bible gives are different; but they all appear to agree in representing a figure composed of parts taken from different creatures, as a man, a lion, an eagle, or an ox (see Genesis, Exodus, and Ezekiel). Clemens of Alexandria thinks that the Egyptians imitated these cherubim in their sphynxes and hieroglyphical animals. Whatever ambiguity, however, there may be, as to the form of these symbols, there is little doubt that they were intended (says Dr. Kitto) either as directly emblematic of the Deity, or significant of the ruling powers by which the agency of God is carried on in the natural and moral world.

CHESHIRE (iv. 467–70). According to the census of 1851, the entire population of the county was 455,725; of which 228,386 were males, and 233,339 females. Of houses, inhabited and uninhabited, there were 89,601. The population of the principal parishes and towns was as follows:—

Acton	3,165	Lymm	3,156
Altringham ...	4,488	Macclesfield ...	39,048
Astbury ...	16,501	Marple	3,555
Bebington ...	10,016	Monks Coppenhall	4,571
Birkenhead ...	24,285	Mottram ...	21,215
Bollington ...	4,655	Nantwich ...	5,426
Bredbury ...	2,991	Naulton ...	3,044
Bunbury ...	4,753	Over	3,167
Cheadle ...	10,479	Poulton... ...	3,044
Chester ...	27,766	Runcorn ...	8,049
Congleton ...	10,520	Sandbach ...	2,752
Coppenhall ...	5,066	Stockport ...	53,835
Davenham ...	6,294	Sutton	7,525
Dukinfield ...	22,394	Tranmere ...	6,519
Frodsham ...	2,099	Werneth ...	3,635
Hawarden ...	6,203	Woodchurch...	2,927
Hurdsfield ...	4,016	Witton	3,493
Hyde	11,569	Wybunbury...	4,389
Knutsford ...	3,127		
Liscard... ...	4,100		

CHESTNUTS (iv. 476). There are many chestnut-trees now in existence of great antiquity, some of them more than a thousand years old; and their immense size is as wonderful as their growth. The great chestnut-tree at Tortworth in Gloucestershire is noticed, in writings still extant, as flourishing in 1135; and one of the wonders of the Island of Sicily is the gigantic chestnut-tree, situated on Mount Etna, known by the name of the Castagno de Cento Cavalli, because it is said to be capable of affording shelter to 100 horses under its boughs. It is said by the natives to be 'the eldest of trees.' At present it appears to consist of seven distinct trees, which are considered to have been originally one trunk. The largest is 38 feet in circumference, and the circuit of the whole is 163 feet. Though the heart of the trunk is decayed, and a public road leads through it wide enough for two coaches to drive abreast, it still bears rich foliage. In the middle cavity a hut is built for the accommodation of those who collect and preserve the chestnuts.

CHEVAGE, in the middle ages, a tribute paid to the feudal lords as an acknowledgment of lands held in villenage. It was a sort of poll-tax or head-money; and by Pat. 8 Edw. I. it appears that the Jews paid chevage or poll-tax to the sovereign, for being permitted to live in England.

CHIL'MINAR, or TCHIL-MINAR ('forty pillars'), the name of the celebrated palace of ancient Persepolis, which was partly destroyed by Alexander the Great. The ruins are still visible, and it is considered to have been one of the noblest specimens of architecture of which antiquity could boast. The fragments which remain have been described by Sir Robert K. Porter, in his interesting volume of 'Travels.' There are about eighty ruined columns; some of which are but 6 ft. high, and about nineteen that are entire; and one detached from the rest, about 150 paces distant. The first plan of a building erected upon a rock of hard black marble, is ascended by ninety-five steps cut in the rock. The gate of the palace is 20 ft. wide; on one side of which is the figure of an elephant, and on the other of a rhinoceros, each 30 ft. high, of very fine marble. After this is passed there are a great number of white marble columns, the smallest of which is fifteen cubits high, the largest eighteen. Each has forty-three flutings of three inches broad. From these remains the extent and magnificence of the edifice may be calculated. (Nuttall's *Class. Dict.*)

CHINA (iv. 480–501). From the treaty of 1842 to the time of the collision which has recently taken place with the English at Canton (as hereafter narrated), there have been few occurrences, connected with the foreign relations of China, worthy of general attention; but, in her domestic affairs, some important events have transpired. On the death of Taou-kwang, in 1851, (with whom the treaty of 1842 was negotiated), his son, Hien-Fung, succeeded to the empire. About this time a rumour became current in Europe, that a rebellion against the domination of the Mantchou Tartar dynasty had taken place in China. It was at first considered a mere conflict between the tax-gatherers and the people, which would be easily suppressed; but, on the receipt of more perfect information, it was discovered that the imperial troops had been signally defeated; and that the insurrection was fully organized, and rapidly spreading. Armies had been beaten, cities captured, and the finest provinces overrun. It was evident that the imperial government considered itself in danger, for it sent large armies to oppose the audacious rebels; but they were everywhere defeated, and the latter received with cordiality by the native population. It was evident that the easy victories which the English gained over the Tartar races had inspired the native Chinese with feelings of contempt for their military prowess.

The district where this insurrection first broke out was Kouang-si, or Quang-si—a mountainous region, situated at the south-western extremity of the Chinese empire. The inhabitants, especially the Miao-tzes, are an indomitable race of warriors, who have never been subdued by their Tartar invaders; and they now took up arms, as their proclamation avowed, for the purpose of annihilating the entire race. The first announcement of their existence was in the Pekin journals of August, 1850, when the rebellion was designated merely as a predatory disturbance in Quang-si. It was not long after, however, that the rebels succeeded in taking possession of some important towns on the frontiers of the province of Canton. The viceroy immediately despatched troops against the insurgents; but his forces were annihilated. The viceroy, in a state of consternation, hurried off to Pekin, to report the alarming state of affairs, and the rebels immediately entered Kouangtong. The principal leader of this insurrection was Tschu-kin-Tao, who claimed to be a descendant of Yuen-chang, who in the year 1352 headed a revolt, and, after a struggle of sixteen years, drove out, in 1368, the Mangolian dynasty, which then oppressed the native Chinese, and founded the dynasty of Ming. The Ming dynasty remained at the head of the state until the year 1644; when it was, in its turn, expelled by the Mantchoo dynasty of Tsing, of which the present emperor is the representative. This insurgent chief assumed all the prerogatives and distinctions of royalty. He issued manifestoes as generalissimo in the army of the restored dynasty; and his forces, by degrees, extended their conquests through the provinces of the two Quang-sis, until they obtained possession of Chin-kiang-foo, Nankin, Amoy, and Yang-chow. The most interesting feature, however, of this insurrection, was the surprising fact, that the rebels professed to be Protestant Christians. Although the Bible is their rule of faith, they have no priests or religious teachers; as they hold that all believers are sufficient for such purposes. They declare themselves, and the Imperialists describe them, as worshippers of Jesus; and they circulate tracts, which are drawn directly from the Scriptures.

The Christian religion, it appears, first found its way into the mountainous district of Quang-si, where the rebellion originated, through the me-

dium of the various missionaries, who early pursued their labours in the kingdom of Annam, a south-eastern district, bordering on these Chinese provinces, where the truths of the Christian religion were first heard in 1627, and responded to by 200,000 conversions. Thus we find that a religious movement has long been at work, which cannot fail eventually to revolutionize the whole empire.

In 1856 a serious collision took place between the Chinese authorities at Canton and the British government of Hong Kong. It arose from one of the Imperialist functionaries seizing a number of Chinese on board a native vessel, or lorcha, while under the protection of the English flag. When all the remonstrances of the Consul at Canton, backed by those of Admiral Seymour, proved unavailing, the British commander had no other recourse than an appeal to force. There was no ambassador at Pekin, and no means of access to higher authorities than those who had so contemptuously disregarded the representations made through the ordinary diplomatic channels. The warlike drama appears to have been developed through its various stages with unexampled rapidity. The original outrage was committed on the crew of the lorcha on Oct. 8th. Consul Parkes went on board shortly afterwards, in the hope of arranging the dispute, but was insulted and threatened with violence. After some diplomatic interchanges the business was placed, on the 21st of the same month, in the hands of Admiral Seymour, whose interposition was so prompt and vigorous, that within three days the forts of Canton were taken and destroyed. The Chinese Governor-General of the province, Yeh, proving still stubborn, and declining even to give the admiral an interview, in another three days the British ships opened fire on his palace, when much property was destroyed, and many lives lost among the Chinese during the bombardment. Two days later the city walls were breached and stormed; the English took possession of the place, and penetrated to the Governor's palace; but the troops were withdrawn in the evening, after a very trivial loss. Attempts at negotiation were then renewed, but again proved fruitless. In November following, the whole city of Canton was bombarded, the Bogue forts captured, and 43 junks taken or destroyed; but the Chinese still showed no signs of submission. At length it was found necessary to place the harbour of Canton under strict blockade; and active operations were only suspended on account of the insurrection in India, but on the 29th of December, 1857, the city of Canton was captured by the united English and French forces.

The population of the Chinese empire has been considered by many travellers and writers as highly exaggerated; but, during the late operations of the British squadron under Admiral Seymour, when the palace of the Viceroy of Canton was taken possession of, a most important volume in the Chinese language was discovered, which had been produced at the imperial printing-office of Pekin, and appears to remove all doubts as to the immense population of the empire. It was entitled 'List of the Population of China and of her colonies, according to the census made by order of the sublime Emperor Hien Fung, and in the fourth year of his reign (1852).' The Emperior Hien Fung is now on the throne, and the census which he has made is thirty-seven years more recent than that executed in the reign of Kia King. During that period the population of China has increased in a considerable proportion. In 1815 it was 371,000,000, and in 1852 it had reached 396,000,000. It may now be calculated, without exaggeration, at 400,000,000. The province of Kiang Sou alone has 87,900,000 inhabitants; that of *Gan Hyvuy, 34,000,000; Kiang Li, 20,000,000; Chang Tung, 29,000,000; Tchy Li, 28,000,000; Houfel, 27,000,000; Ho Nan, 26,300,000.* In these different provinces there are a number of cities, the population of which varies from between 500,000 and 1,000,000. Many towns of minor importance contain as many as 25,000 souls. This excess of population raises up devastating hordes, who continually ravage the country, and this creates an enormous mass of individuals without house or home, who are ready for any outrage. It also produces the inexhaustible number of emigrants, who now begin to replace negroes in South America.

A few years since the governors of the provinces of Tchy Li, Kiang Sou, Chang Tung, and the Kiang, could devise no other means than authorising the poor inhabitants to throw their children into the rivers within twenty-four hours after their birth; and this unnatural plan was actually carried into execution.

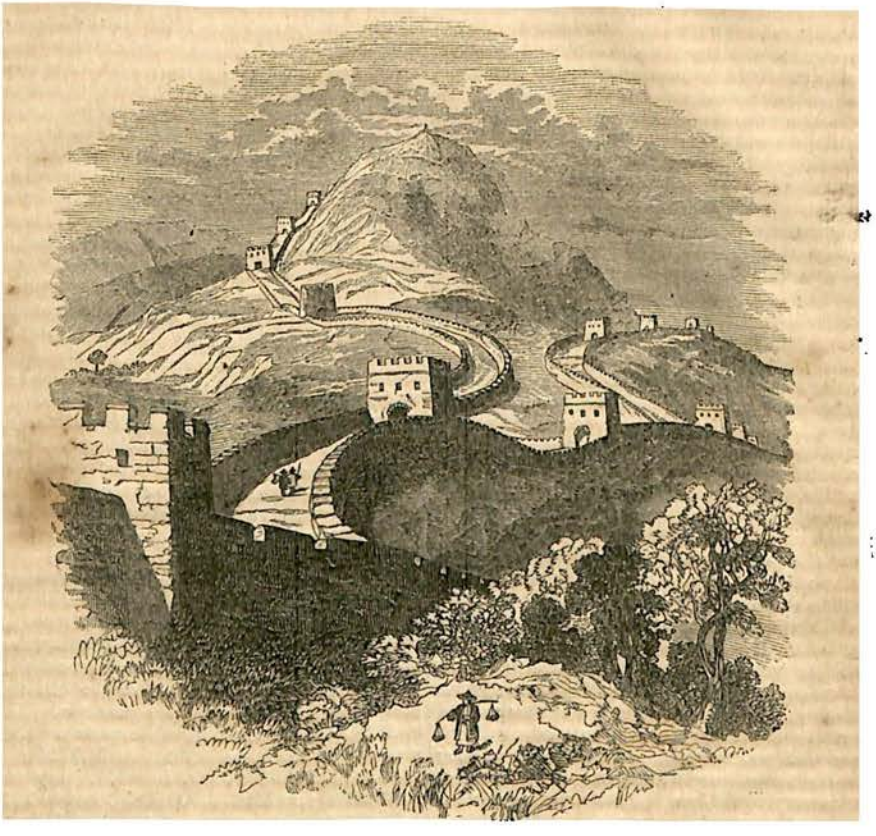
Our commercial intercourse with China has not been so extended as was anticipated; still it has been, in some small degree, progressive; and, for the purposes of comparison, we subjoin the returns for three years preceding the disturbances that led to the former Chinese war, and of the last three years of which returns have been made. Thus, in 1834, the value of British exports to China was 842,852*l.*; in 1835, 1,074,708*l.*; in 1836, 1,326,388*l.*; while, in 1853, they were 1,749,597*l.*; in 1854, 1,000,716*l.*, and in 1855, 1,122,241*l.* The exports of tea from China to Great Britain, America, and other places, in 1851-2, were 112,350,000 lbs.; and in 1853 her exports of tea to the United States alone amounted to 40,303,600 lbs.

In 1855-6 the total export of tea from China to Great Britain, from July to January, was 56,005,100 lbs.; and in 1856-7 the total export, for the corresponding period, was 39,991,400 lbs.

In 1843-4 not a single bale of silk was exported from China to Britain; while in 1855-6 50,489 bales were exported.

CHINA, GREAT WALL OF. This vast work of art may be considered a masterpiece of human industry, and one of the greatest wonders of the eastern world. According to Du Halde it was built by the Emperor Chien-chu-Toang, about 220 years before Christ. It is carried over a mountainous country, on the northern borders of China Proper, for an extent of 1250 miles, and

was built to prevent the incursions of the northern Tartars. It is from 20 ft. to 25 ft. high, and is sufficiently wide to enable six horsemen to ride abreast. There are numerous towers at short intervals, some of which are 48 ft. high, and 50 ft. wide. Although it has stood for upwards of 2000 years, it still remains firm and compact. But it has long ceased to form any effective barrier against the Tartar inroads; and may now be considered as a mere geographical boundary. Except at the road passes, where most of the garrisons of the north are located, nothing is done to keep the wall in repair. Beyond the Yellow River, to its western extremity (according to Gerbillon), it presents a mere mound of earth or gravel, about 15 ft. in height, with only occasional towers of brick, or stone gateways.'



CHINESE TYPES. In the late Exhibition of National Industry, one of the most remarkable typographical displays was the collection of types to represent Chinese characters. We learn from a little work, entitled 'Novelties, Inventions,' &c., that these types 'were manufactured by Begerhaus, of Berlin, for the American Missionary Society. The Chinese vocabulary is made up of a number of distinct words, which are not built up from component letters, as in European languages, but have a good deal of the hieroglyphic effect about them. To imitate these words or characters by movable types has always been deemed a difficult matter. M. Begerhaus has analyzed the lines and dots of the Chinese language, so as to make 4200 letters out of them, or elements, which will serve the compositor in lieu of letters. The steel punches of all these 4200 types were shown; and by various combinations of them, about 24,000 Chinese words or characters can be imitated; and it was very interesting to see copies of the Bible and the New Testament printed in Chinese by the aid of the types.'

CHINGHAE, a large fortified city of China, situated on the banks of the great river Takia, near Ningpo, in the province of Tche-kiang. The walls are nearly three miles in circumference. All the surrounding heights are fortified, and present a military position of great strength. When the British, after a severe contest, gained possession of Chinghae, they found it to consist of one great arsenal, with a cannon foundry and gun-carriage manufactory in active operation, together with various warlike stores in vast abundance. (Montgomery Martin's *China*.)

CHING-KEANG-FOO, a strongly fortified city of China, situated on the river Yang-tze-kiang, at the entrance of the great imperial canal.

The city is about four miles in circumference; and the suburbs are much larger. It was by the capture of this place that the final struggle between the Chinese and the British troops, in 1842, was decided. [CHINA, iv. 499.] To the westward of the suburbs is the island of *Kinshan*. It is surmounted by a seven-storied pagoda; and around its base are a few temples and imperial pavilions, only occupied by Chinese priests, and partly in a ruinous condition. (*Ibid.*)

CHIROG'RAPHY (Gr. χεὶρ and γραφὴ, handwriting), among our Anglo-Saxon ancestors the name of a public instrument or conveyance, which was attested by the signature or crosses of the witnesses. By the Normans the same kind of instrument was called *Charta*. Subsequently, to prevent fraud, these deeds were effected by a script and rescript; and in the middle, between the two copies, was drawn, in capital letters, the word *Chirographum*, which, being cut asunder in an indented manner, proved the genuineness of the part and counterpart of the instrument at any subsequent period. (Nuttall's *Archæological Dictionary.*)

CHIRONEC'TES (Gr. *hand-swimming*), a genus of cheliform fishes, which constitute the family Chironectidæ, or Frog-fish.

CHIROS'TOMA, a genus of fishes, with oblong bodies, belonging to the family Zeidæ.

CHLÆNA'CEÆ, a natural order of trees, or shrubs, with red showy flowers in a permanent crust-shaped involucre, whence the name. They are all natives of Madagascar.

CHLORANTHA'CEÆ (Gr. *green-flowered*), an order of herbaceous aromatic plants, which are natives of tropical India, South America, and the West Indies.

CHLORIDE (Gr. χλωρὸς green), a term applied by chemists to the various combinations of chlorine (iv. 511–13) with simple bodies; as chlorides of azote, bismuth, boron, cadmium, calcium, carbon, &c.; but perhaps the most important combination, on account of its great utility in the arts, is *Chloride of Lime*, a preparation most extensively used in the process of bleaching (iii. 415), generally called Bleaching powder. It is made by exposing slacked lime in fine powder in a chamber filled with chlorine gas, until it refuse to absorb any more. According to Dr. Thompson, the combination consists of 3 atoms of chloride of calcium, and 1 atom of chlorite of lime; but in that made by Messrs. Tennant and Macintosh, of Glasgow, who were the first manufacturers of the article, the composition consists of hydrate of lime, 4·625, and chlorine, 4·5. According to Dr. Ure's analysis, the bleaching powder consists of 39·5 chlorine; 39·9 lime; and 20·6 water. The bleaching properties of this chloride are so considerable, that it is now always used in this country for the bleaching of cotton cloth, which is no longer required to be exposed to the sun upon the grass; and hence those extensive bleaching grounds, formerly in request, are no longer required.—*Chloride of Potash* is also a very valuable compound, prepared in various ways. When potassium is introduced into chlorine gas, it burns with a brilliant red flame, the chlorine is absorbed, and the whole is converted into a white saline mass. The preparation of Professor Jack is perhaps the most simple. He passes chlorine gas into a mixture of 1 lb. of caustic lime, and 1 lb. of potash, with 8 lbs of water; and chloride of potash is the result.

CHLORITE (Gr. χλωρὸς *green*), a mineral of various shades of green and greenish-grey, commonly called prismatic talc or mica. There are three varieties—the slaty, foliated, and green earth. It is crystallized in flat, six-sided prisms; and its component parts are—silica, 62·0; magnesia, 27·0; oxide of iron, 3·5; alumina, 1·5; water, 6·0. Nearly allied to this variety is the *Chloropal*, a mineral found associated with opal in Hungary, which is earthy and conchoidal.

CHLOROM'ETER, an instrument used in testing the bleaching powers of the chloride of lime, by which means the relative strength or qualities of the samples of that useful preparation are readily ascertained.

CHLOROM'ETRY, or CHLORIM'ETRY, is a chemical term, derived from the French word *Chlorometrie*, and applied by them to the process adopted for estimating the decolorizing quality of any compound of chlorine, especially the chlorides of potash, soda, and lime. The process is generally employed, in this country, to ascertain the value of chlorinated lime, commonly known as bleaching powder. There are three modifications of the processes which are in general adoption, and the following is a brief outline of them.

The first process consists in the determination of what quantity of the sample of bleaching powder under examination is required to convert a protosalt of iron into a persalt. Fifty grains of the bleaching powder are dissolved in a small quantity of water, and transferred to an alkalimeter, and water added, so that it may fill 100 measures; each measure, therefore, of the alkalimeter contains half a grain of chlorinated lime. To convert 78·1 grains of pure crystallized sulphate of iron into the persalt, 10 grains of chlorine are requisite; consequently, by ascertaining the number of measures of the solution of chlorinated lime required to peroxydise the salt, the percentage of chlorine is readily ascertained. The point at which the iron is peroxydised is ascertained by adding a little solution of red prussiate of potash (ferridcyanide of potassium) to a minute drop of the solution; and if no blue precipitate be caused, complete oxidation has been effected.

The second method is founded on the conversion of arsenious acid into arsenic acid by the action of chlorine gas in the presence of water; the result being the formation of arsenic and hydrochloric acids. To effect this, 14 parts of arsenious acid require 10 parts of chlorine. And the point of oxidation is determined, in this case, by the use of a few drops of solution of sulphate of indigo, which should be added, so as just to give a blue tinge to the liquid. On a sufficient quantity of the solution of bleaching powder being added, the blue tinge is at once destroyed by the free chlorine, the quantity of chloride used to this effect noted, and the quantity of chlorine readily calculated.

The basis of the third modification is the conversion of yellow prussiate of potash (ferrocyanide of potassium) into the red prussiate of potash (ferridcyanide of potassium) by the action of chlorine gas, and for this effect to be produced, 119·7 parts of the salt require ten parts of chlorine. The quantity of the bleaching powder necessary to produce this effect is noted, the percentage of chlorine calculated, and the point at which the change occurs is readily determined by the non-production of a blue precipitate when a minute quantity of a persalt of iron is added.

The less the quantity of the chlorinated lime requisite in these cases to produce the required effect, the more abundant is it in chlorine, and consequently so much the more valuable.

CHLOROS'TOMA (Gr. χλωρὸς, and στόμα a mouth), a genus of Mollusca, allied to the Trochus, and of the family Trochidæ.

CHORAGIC MONUMENT OF LYSICRATES (iv. 520), a beautiful little structure in the south-west part of Athens, commonly called the Lantern of Demosthenes. It presents the earlier specimen of the Corinthian order found in that celebrated city, and has always been looked upon as one of the most interesting remains of classical antiquity. It is a circular edifice of white marble, and only 6 ft. diameter within. It is in form so much like a lantern, that it is no wonder it has obtained that name. The roof is supported by six fluted columns of the Corinthian order 9⅔ ft. high; and the intermediate space is filled up with pannels of marble of one stone from the top to the bottom. The frieze above this colonnade consists of one circular stone. The whole is surmounted by a cupola, which appears to imitate a covering of leaves or scales; and, on the top of this cupola, is a kind of floweret similar to a Corinthian capital. The ornaments on the top appear to have been a tripod; but the cavities for its reception alone remain. The frieze is beautifully decorated with allegorical figures representing some mythological story, which has puzzled our antiquarian travellers. The whole, however, has been restored by Stuart, who explains the story, which these figures are intended to represent, as Bacchus and the Tyrhenian pirates; the scene of action being on the sea-shore. On the architrave appears the following inscription, in ancient Greek characters, which sufficiently explains the original design of the monument:—

Λυσικράτης Λυσιθείδου Κικυννεὺς ἐχορήγει
Ἀκαμαντὶς Παίδων ἐνίκα· Θεὼν ἠύλει·
Λυσιάδης Ἀθηναῖος ἐδίδασκε· Εὐαίνετος ἦρχε.

It may be thus translated:—'Lysicrates, the son of Lysithides, of Cicynna, exhibited a musical entertaintment: the boys of the tribe of Achamas gained the victory: Theon was the first flute player: Lysiades, of Athens, composed the flute: Euenetus was Archon.' Thus it is evident that the choragic contests were not of an athletic but of a musical character, and that this monument was erected in honour of the successful musicians. It is evident from Pausanias that these edifices were once very numerous. Among others, the choragic monuments of Thrasyllus, Thrasicles, and Nicis are mentioned. (Dr. Nuttall's *Communication to Fosbroke's Encyclopædia of Antiquities.*)

CHRYSOS'TOMA (Gr. *golden-mouthed*), a genus of Mollusca, of the family Trochidæ, the shells of which are turbinate, and the whorls convex.

CHURCH-BELLS (iii. 126—Bells). From the fifth century, when church-bells first came into use among Christian communities, their size and tones have always formed matters of great interest. The Papal, the Greek, and the Protestant churches have vied with each other in securing these important objects. Hence every cathedral, or church of the least consequence in the Christian world, has prided itself on the possession of ponderous bells. In this respect the city of Moscow, the old capital of the Greek church, has outrivalled all others. The great bell, which was broken in 1737, weighed 250 tons; and the one of 1817, 110 *tons*; and three others, 16 to 31 tons. At Novogorod, also, the Russians had one of 31 tons. The following is an enumeration of the principal bells in Europe, with their respective *sizes*:—Vienna, 1711, 17 tons, 14 cwt.; Olmutz, 17 tons, 18 cwt.; Westminster, 1856, 15 tons, 18½ cwt.; Erfurt, 1497, 13 tons, 15 cwt.; Paris, 1680, 12 tons, 16 cwt.; Sens, 13 tons; Montreal, 1847, 12 tons, 15 cwt.; Cologne, 1448, 11 tons, 3 cwt.; Breslaw, 1507, 11 tons; Gorlitz, 10 tons, 17 cwt.; York, 1845, 10 tons, 15 cwt.; Bruges, 1680, 10 tons, 5 cwt.; St. Peter's, Rome, 8 tons; Oxford, 1680, 7 tons, 12 cwt.; Lucerne, 1636, 7 tons, 11 cwt.; Halberstadt, 1457, 7 tons, 10 cwt.; Antwerp, 7 tons, 3 cwt.; Brussels, 7 tons, 1½ cwt.; Dantzic, 1453, 6 tons, 1 cwt.; Lincoln, 1834, 5 tons, 8 cwt.; St. Paul's, 1716, 5 tons, 4 cwt.; Ghent, 4 tons, 18 cwt.; Boulogne, new, 4 tons, 18 cwt.; Exeter, 1675, 4 tons, 10 cwt.; Old Lincoln, 1610, 4 tons, 8 cwt; fourth quarter-bell, Westminster, 1857, 4 tons.

CHURCHES AND CHAPELS, BUILDING OF. The general census of 1851 contains some interesting details of the progress of Church-building during the present century. It appears that previous to 1800 there were 9667 churches in existence. Between 1801 and 1811 there were 55 churches built; from 1811 to 1821 there were 97; between 1821—31, 276 churches; between 1831—41, 667 churches; between 1841—51, 1197 churches; dates not mentioned 2118 churches. The returns of the census of 1831 give 11,825 as the number of churches and chapels then in existence; and as the returns for 1851 give 13,854, exclusive of 223 not separate buildings, upwards of 2000 must have been erected within that period. In 1818 the State passed an Act to apply 1,000,000*l.* to build churches, and in 1824 granted 500,000*l.* more for the same purpose. It made no further grant prior to 1831, but between that period and 1851 it advanced 511,385*l.* for the same object. In this latter period, however, it is calculated that 6,087,000*l.* must have been expended; the bulk of which has been raised by private subscriptions, and by an improved application of the revenues of the church.

In the whole of England, the proportion of

people to churches was greater in 1851 than in 1831; but, as a great number of churches were in places were the congregations were small, the increase of churches, where the population is most numerous, implies that, on the whole, the people were much better provided with church accommodation in 1851 than in 1831. Between 1818 and 1851, there were 520 churches built by the commissioners for building new churches, at a cost of 3,019,747*l.* Between 1801 and 1851, 2529 new churches were built, at a cost of 9,087,000*l.*, of which the State contributed the above sum of 1,663,428*l.*; and 7,423,571*l.* was derived from private subscriptions and other sources. Returns were obtained from 23,390 places of worship, including returns from those not of the establishment, 14,077. Before 1801 the establishment possessed 9667 churches, and all other religious bodies then possessed 3426; consequently, while the number of churches has been augmented by 4410, the number of chapels has been increased by 19,964. The Wesleyans of all kinds, who, in 1801, possessed only 971 chapels, in 1851 possessed 11,007. In 1801 the Baptists of all descriptions had 592 chapels; they have now 2789. The Independents had then 849 chapels, and now, according to the census, they have 3244.

Sittings are provided by the Church of England for 5,317,915 persons, or 29·7 per cent. of the population; by the Wesleyan Methodists for 2,194,298 persons, or 12·2 per cent.; by the Independents for 1,067,760, or 6 per cent.; and by the Baptists for 752,343 persons, or 4·2 per cent. Including all the denominations, it is calculated that, on the whole, sittings are provided for 10,212,563 persons, or for 57 per cent. of the population.

CHURCHESSET, a Saxon term, used in Domesday, to signify corn paid to the priest. According to Fleta it consisted of a certain measure of wheat, which every man was obliged to give to the church on St. Martin's day.

CHURCH-SCOT, in the middle age, a kind of clerical tax, or oblation paid to the priests. Sometimes the religious portion of the community, who were in good circumstances, purchased an exemption from the tax for themselves and their tenants.

CHURLE, or CEORLE, among the Anglo-Saxons, a term applied to free tenants, who held their land of the Thanes, not as serfs, but on condition of rents or services. They were in fact tenants at will, like many of our farmers. But there was a class of churles of an inferior class, who gave to the lord a certain amount of labour, by tilling and manuring the land; and these, according to Spelman, were called *sockmen*, or ploughmen.

CID'ARIS, in conchology, a genus of Snake shells, or Senectinæ, which are turbinate, pearly, and smooth. Also a genus of Echini, made up of polygonal plates, and the surface divided vertically by bands.

CINNAMON-STONE, a mineral of red colour, found in Sweden, Brazil, and Ceylon. It is composed of silica, 40; alumina, 22·99; lime, 30·57; oxide of iron, 3·66; with minute portions of magnesia and potash. It generally occurs in masses full of fissures.

CIPPUS, in classical antiquity, a short stone column, erected along the highways, which contained an inscription directing the way to travellers. Sometimes it was intended as a boundary, or to record some memorable event, or otherwise mark the grave of some individual interred on the spot. The *cippus pœmerii* was the boundary stone which fixed the limits of a city, town, or district. In tracing the circuit of a town or boundary with the plough, these cippi were placed at certain distances, upon which they offered sacrifices. Sometimes towers were erected on the site of these cippi.

CIRCASSIA (iv. 585). Of late years this interesting country has attracted the admiration of Europe by her heroic resistance to the gigantic power of the Russian empire. By the treaty of Adrianople, in 1830, the whole of the Circassian coast was transferred to Russia by the Ottoman Porte. But, as the inhabitants had never acknowledged the dominion of Turkey, but always considered themselves as entirely independent, they determined on resistance, and have ever since been able to set at defiance the military power of Russia. In 1838 an engagement took place, in which the Russians were defeated with vast slaughter, and a great number of their vessels burnt. During the battle a body of Russian cavalry, with officers, arms, and baggage, went over to the enemy, and decided the contest. In 1841 the Russians sent an expedition of 30,000 men against the Circassians; and of this force, only 2000 escaped the swords' of their enemy. Schamyl, a daring chieftain of the mountain tribes lying between the Caspian and the Black Seas, has been a severe thorn in the sides of the Russians, and frequently defeated them in his predatory warfare. In an action fought on the 13th of April, 1853, at the head of a small and heroic band, Schamyl defeated 40,000 Russians, captured several guns, and inflicted other severe losses on the enemy. But during the late contests between Russia and the Western Powers, the Circassians, as well as the other mountain tribes of the Caucasus, appeared to have relaxed in their efforts against the common enemy, and scarcely afforded any assistance. The consequence was, that at the treaty of peace they were altogether unnoticed, and left to settle their differences with Russia in the best manner they could. The result is, that they are again involved, single-handed, in a sanguinary contest with their powerful foe, by whom, in all probability, they will be eventually subjugated.

CISLEV, the name of the ninth month (or November) of the Jewish ecclesiastical year, and the third in the political or civil year.

CISTVAENS, a sort of rude monumental stones found in different parts of England, and attributed to the ancient Britons. They are usually found in cairns or barrows, but sometimes singly. They consist of three large stones, two upright, and one horizontal, and this forms a trilithon. Kit's Cotty House, in Kent, is an excellent specimen. Sir R. C. Hoare has endeavoured to show, from

these cistvaens, that cromlechs were altars. He says that five cistvaens were found placed in a circle with a cromlech in the centre, and that bones were found under each of the cistvaens, but none under the cromlech. (Nuttall's *Class. Dict.*)

CITIES (iv. 606). The most celebrated cities of antiquity were BABYLON and NINEVEH (the ancient capitals of Assyria); EPHESUS, the splendid capital of Asia Minor; PERSEPOLIS, a magnificent city of ancient Persia; MEMPHIS, the ancient capital of northern Egypt, and THEBES of the southern; CARTHAGE, the celebrated rival of Rome, situated on the same continent; ATHENS, the capital of Greece, and the beau-ideal of everything that was beautiful in art and sublime in genius; and ROME, the largest, the wealthiest, and most powerful city in the world. (Each of these places will be found under their respective heads.)—In modern times, LONDON is the largest and most opulent city in Europe, and PEKIN, the capital of China, the largest in Asia.

CLACKMANNAN, COUNTY OF, in Scotland (iv. 618). According to the census of 1851, the population of this county was 22,951. The population of the principal towns was as follows:—

Alloa ..	pa. 9,493	Clackmannan	t. 1,535
—— ..	t. 6,676	Dollar	1,574
Clackmannan	pa. 5,802		

CLARE, COUNTY OF, in Ireland (iv. 623-6). According to the census of 1851, the population of the county was 212,428, and the inhabited houses 44,870. The population of the principal towns was as follows:—

Clare ..	pa. 3,280	Ennistimon ..	2,089
—— ..	t. 879	Killaloe ..	2,783
Corofin	907	Kilrush	pa. 11,385
Ennis	8,623	——	t. 5,071

CLA'RIAS (Lat. *clarus* shining), a genus of fishes, of the family Siluridæ, in which the dorsal fin is single, and the caudal one rounded.

CLARKE, SIR CHARLES MANSFIELD, M.D., physician to her late Majesty Queen Adelaide, and one of the most distinguished ornaments of the medical profession, was the son of Mr. John Clarke, surgeon, of Chancery Lane, London, and born in 1782. He received the rudiments of his education at St. Paul's School. Having completed his preliminary studies, and gone through the regular routine of the hospitals, he was admitted a member of the Royal College of Surgeons, and spent the two first years of his professional life as assistant-surgeon in the Herefordshire militia, which he subsequently exchanged for the post of surgeon in the 3rd Regiment of Foot-guards. He was afterwards induced to give up the army, and to devote his whole attention to the diseases of women and children, and more particularly to the practice of midwifery. He associated with his brother as a lecturer on these subjects as early as 1804, and continued to deliver his regular courses of lectures down to the year 1821. For many years he held the appointment of surgeon to Queen Charlotte's Lying-in-Hospital. Having obtained the degree of M.D. in 1827, Dr. Clarke became a licentiate of the Royal College of Physicians; and on the accession of King William IV. to the throne, he was honoured by the appointment of physician to Queen Adelaide. On September 30, 1831, he was created a baronet; and in the year 1836 he was elected a Fellow of the Royal College of Physicians. In 1842 he had conferred upon him the honorary degree of M.A. by the University of Cambridge, and was created a D.C.L. of Oxford in 1845. Incessantly engaged in the performance of the active duties of a most laborious department of his profession, Sir Charles had not much leisure to devote himself to literature. His chief work, and that by which his name will be longest remembered among medical circles, is his 'Observations on the Diseases of Women and Children,' which he published in two parts, in 1814 and 1821 respectively. He was President of the Society for the Relief of Widows and Orphans of Medical Men, in which he took the deepest interest to the last. He died at Brighton in 1857.

CLAS'SICUM, a term applied by the Romans to a certain number of trumpets placed round the eagles of a Roman army. The trumpet placed near the tent of the general first gave the signal, when those near the eagles answered, and immediately afterwards all the trumpets of the different cohorts. The term was also applied to the public proclamation, by sound of trumpet, of any citizen being accused of a capital crime. In the Middle age, the ringing of bells for any solemn festival, or for the dead, was known by the name of *classicum*.

CLASSIS, one of the six divisions into which the citizens of Rome were divided by Servius Tullius, for the purpose of more readily estimating every man's income, and his position in the state. The first class consisted of the Equites and the most wealthy citizens of Rome; and the sixth of the poorest of the people. The four intervening classes comprehended the professionals, tradesmen, artizans, and mechanics. Gentlemen of the first class, by way of eminence, were called *classici*, and the rest were said to be *infra classem*. Hence originated the term *classics*, as applied to Latin and Greek studies, and to the first-rate authors. The six classes were subdivided into 193 centuries. [CENTURIATA.]

CLAUS'THALIE (from *Clausthal*, in the Hartz, iv. 636), a mineral of a lead-grey colour and metallic lustre, known as the selenuret of lead. It consists of lead, 70·98; selenium, 28·11; cobalt, 0·83; its specific gravity being 8·2.

CLAVICAN'THA (Lat. *clavus* hollow, and Gr. ἄκανθα a spine), a genus of Mollusca, of the family Cerithidæ, the shell of which is thick and sub-fusiform, and the surface rugose.

CLAY, HON. HENRY, the American statesman, who may be said to have closed the great political epoch, to which the most distinguished citizens of the Revolution belonged. He was born in 1777, in Hanover county, Virginia, three years after the American declaration of Independence, and in the state which was to produce some of the first champions and governors of the American Confederation. His life, indeed, may be said to include the whole era of his country's history, from the formation of the Union to the

consolidation of her prosperity and power. After passing through the ordinary routine of education, young Clay was placed in the office of Mr. Peter Tinsley, clerk of the Chancery at Richmond. He afterwards became the pupil of Chancellor Wythe, from whose disinterested friendship he derived many advantages. At the age of twenty he began to practise at the bar, in the state of Kentucky, and was soon afterwards elected a member of the Convention to form a state constitution for Kentucky. The assembly of that state had so high an opinion of his statesman-like qualities, that at a very early age they elected him as senator of the United States, which exalted position he continued to hold during the greater portion of his life. In one of the intervals of his senatorial career he was returned to the House of Representatives; there raised to the dignity of Speaker of the Assembly. Amidst all his political duties, he still continued to practise at the bar with the greatest success. But in 1824, having powerfully exerted himself to carry the presidential election in favour of John Quincy Adams, he was appointed, by the new president, to the office of Secretary of State, the duties of which he long continued to discharge, to the great satisfaction of his fellow-citizens. Although Mr. Clay might be said to hold the highest rank as an advocate, a parliamentary orator, and a minister, yet but a small period of his life was spent in official power; and though regarded by his countrymen as the first citizen of the age, he never succeeded in arriving at the presidential dignity; but had to serve under men who were allowed to be infinitely his inferiors; and this, perhaps, may be attributed to his firm and uncompromising spirit; for he made fewer concessions than any other contemporary statesman to the ever fluctuating demands of popular clamour. His feelings were strongly and exclusively American, which, as a form of patriotism, were extremely honourable to him, but unfortunately they contributed to the prineipal error of his political life; his high authority and arguments were the stronghold, during many years, for that system of high tariffs and protective duties, which has been more detrimental than otherwise to the political interests of the United States. Yet the name of Henry Clay will always deservedly rank high among the statesmen of his country; for he was always a fervent but judicious lover of freedom, and a careful minister to the general interests of his country. In his character there was nothing low or unworthy of a great statesman; and towards foreign nations his policy and language were always of a pacific and conciliatory character. He died at Washington in 1852.

CLAY-SLATE, an indurated laminar clay, or shale, existing most abundantly in the metamorphic rocks, and sometimes found in the fossilliferous strata. It is of different degrees of hardness, with various shades of colour (grey, blue, red, or yellow), but blue is by far the commonest. Its texture, as the name implies, is slaty; sometimes the foliæ are straight, and at other times curved. It is in the former state that this rock answers so well for making roofing slates. Clay-slate usually occurs in mountainous districts. Ben Lomond, in Scotland, is composed of this formation; and also a great portion of the Grampian Mountains. The clay slate in Wales contains abundance of fossils, particularly the Asaphus Debuchii; and on that account it is considered a transition slate. The clay slate in the neighbourhood of Plymouth, which alternates with the limestone rocks, also contains fossil remains. There is considerable difference in the constituent parts of clay-slates; but Dr. Thomson has given the following analysis of a green-coloured slate from Ireland:—silica, 49·23; alumina, 14·56; lime, 5·54; protoxide of iron, 20·776; magnesia, 2·25; moisture and volatile matter, 8·20; the specific gravity being about 2·7.

CLEMENT, WILLIAM, a name intimately connected, for nearly half a century, with the newspaper press of London. He was of humble origin and education; but his early industry and attention as a news-vender were rewarded with the greatest success; and when he resigned his business to Mr. Smith, he was one of the most extensive news-vendors in the metropolis. He first became a newspaper proprietor through the purchase of a share of the *Observer*, which was then a comparatively obscure paper; but through the energy and liberality of Mr. Clement, it soon obtained an extensive circulation. He organized an extensive corps of reporters, on a liberal scale of remuneration, from which he was generally enabled to publish the latest news of the week, and anticipate the morning papers of the following Monday. He also engaged on his staff some of the leading writers of the day, and among others the Rev. George Croly. His success, in conducting the *Observer*, inspired him with the ambition of being the proprietor of a morning paper; and on the death of Mr. James Perry, editor of the *Morning Chronicle*, in 1821, Mr. Clement became a purchaser of that journal (then at the height of its popularity) for the large sum of 40,000*l.*; part of which he raised on bills, which eventually led him into difficulties. About this time he purchased *Bell's Life in London*, which the peculiar talents of Mr. Vincent Dowling brought into repute as a sporting paper. Mr. Clement was almost without a rival, when he purchased the *Morning Chronicle;* but the *Times* and the *Morning Herald* were soon afterwards running a race of extravagant expenditure, which was the means of materially reducing the profits of the *Chronicle*. After struggling on, however, till 1834, Mr. Clement was, in a measure, compelled to sell the copyright to Sir John Easthope, for about one-fourth the sum he had originally given. But he still continued to hold the property of his two Sunday papers; and they were carried on with great success to the time of his death, which took place in 1852.

CLER'ESTORY (*clear story*), in church architecture, an upper story, or range of windows placed above those constructed in the main walls of the building. The windows in the lantern of a cathedral tower are likewise so called.

CLINK-STONE, in geology, a variety of basalt, in which the felspar chiefly predominates. When crystals of felspar are disseminated through it, it

receives the name of trap porphyry. When the felspar greatly prevails, and the texture becomes nearly compact, the variety becomes clink-stone; and when clink-stone has a more earthy structure, it passes into clay-stone. The rock, which is a massive structure, and of a greenish or iron-grey colour, is called clink-stone, and sometimes phonolite, from its yielding a metallic sound when struck with a hammer. It closely resembles the basalt of the Giant's Causeway, in Ireland, and sometimes exhibits the same columnar structure, as in Swarthfell, in Cumberland, where it appears on a grand scale.

CLINT, GEORGE, the distinguished artist, was born in 1770. After long struggling with adverse circumstances, he had the good-fortune to obtain the patronage of Sir William Beechey. The acquaintance was formed in a singular way. He had made his first attempt in oil-painting by taking a portrait of his wife, and having long heard of Sir Wm. Beechey's kindness of feeling towards his professional brethren, he was anxious to have that great artist's opinion of his picture, but could not venture to appear in his presence. His affectionate wife, however, undertook to show the picture to Sir William. She went on foot to his house, with a child on one arm, and her husband's picture under the other. He received her in the kindest manner, ordered wine and refreshments, complimented her on her zealous exertions, and spoke flatteringly of her husband's talents. He moreover requested that Mr. Clint would call on him immediately, and paid for a coach to carry her home. It was to this fortunate interview that Clint owed a long and friendly intercourse with Sir William Beechey. He was afterwards introduced to Sir Thomas Lawrence, which introduction arose from his having engraved a plate from one of Sir Thomas's pictures, who was so much pleased with it, that he gave him the portraits of General Stewart, Sir Edmund Antrobus, Lady Dundas, and several other persons of rank, to engrave. To his talents, both as a painter and engraver, may be attributed that extraordinary success which attended his subsequent career; and perhaps one of the most fortunate events of his life was that of being commissioned to engrave the 'Kemble Family,' which had been painted by Harlowe, and had created an immense sensation at the Royal Academy. So great was the demand for this picture, that it was engraved three times over. Mr. Clint had now arrived at the zenith of popularity, and he was visited by all the distinguished actors and patrons of the drama. The result was, a series of fine dramatic pictures, which will preserve the name of Clint to the latest posterity. The first of these theatrical subjects was a picture of W. Farren, Farby, and Jones, as Lords Ogleby, Canton, and Brush, in the comedy of the 'Clandestine Marriage.' This was succeeded by a picture of Munden, Knight, and Mrs. Orger, in 'Lock and Key.' So highly esteemed was this production, that Mr. Clint was elected an associate of the Royal Academy. He also gave, as a companion picture, the last scene of 'Sir Giles Overreach,' in which Kean played the principal character. These, and many other similar productions (some of which are preserved by the Garrick Club) have perpetuated the celebrities of the English drama during the last age. In portrait painting, Clint was eminently successful. Among others he painted Lord Egremont three times; one of his lordship's portraits being in the Town Hall at Brighton. He also painted Lord Suffield and his lady, Lords Essex and Spencer, General Wyndham, Admiral Windham, and numerous other persons of distinction. Associated with Mulready, Cooper, and other distinguished artists, he was mainly instrumental in establishing the Artist's Benevolent and Annuity Fund, which may be considered as one of the greatest boons to the artist, who, by the exercise of prudence, is enabled to lay by a sum for the comfort and solace of his declining ears. Mr. Clint died at Kensington, in 1854, aged 84.

CLI'TONES, a title of distinction among our Anglo-Saxon ancestors, which was applied to all the members of the blood-royal. The title next in grade was that of Ealderman, or Earl; then Heterogus, or Duke; and afterwards came the distinction of Thane, which, after the Conquest, was succeeded by the Norman Baron. (Selden.)

CLOGG, a kind of calendar or almanack carved on a square block of wood, which, before printing was introduced, was found to be extremely useful in assisting the memory. They appear to have been introduced into this country after the Norman conquest, although they were previously in use under different names, among the ancient Scandinavian nations. The representation of an early English clogg is given under ALMANAC.

CLONCURRY, RIGHT HON. V. B. LAWLESS, LORD, a distinguished Irish patriot, was born in Dublin in 1773. He was originally a Roman Catholic, but eventually embraced the reformed religion. When at college, his lordship took an active part in the Historical Society, which was looked upon as the 'nursery of genius and patriotism;' but it was suppressed by the bigotry of his tutor, Dr. Ebrington, afterwards Bishop of Ferns. In 1792 he went to Switzerland, where he remained for two years; and on his return to Ireland he became a member of the Society of United Irishmen, which had been founded in 1791, under 'the idea of uniting both sects (Catholics and Protestants) in pursuit of the same objects, a repeal of the penal laws, and a reform including in itself an extension of the right of suffrage to Catholics.' Having entered himself as a student of the Middle Temple, he was in the habit of paying frequent visits to London; and on one of these occasions he met with Wm. Pitt, who informed him, for the first time, of the contemplated project of a Union between Great Britain and Ireland. This intelligence produced a lively impression on his enthusiastic notions of patriotism and nationality, and led him to publish, in 1797, a pamphlet, under the title of 'Thoughts on the Projected Union,' which was reprinted at the close of his interesting volume of 'Recollections,' published in 1849. To this essay, perhaps, may be attributed the state prosecutions to which he was afterwards exposed. This was the period of violent revolutionary politics, and Mr. Lawless

was in close intimacy with the leading patriotic spirits of the day—especially Horne Tooke, Sir F. Burdett, Colonel Despard, Lord Edward Fitzgerald, Emmett, Curran, Grattan, Ponsonby, and others. In 1797 he was elected a member of the executive directory of the United Irish Society; and soon afterwards aided in preparing the Kildare petition against the Union, and in favour of Reform and Catholic Emancipation. At the dissolution, which soon afterwards followed, he wrote the addresses of Lord E. Fitzgerald and Mr. Straffan, declining to offer themselves as candidates for the representation of Kildare — the attending of Parliament, as he alleged, being a 'mere mockery.' By these and other overt acts of political disaffection, he became an object of suspicion, and the result was that he was arrested, along with the Duke of Leinster, Mr. Curran, Mr. Grattan, Mr. Stewart, Mr. Trevor, and other Irish patriots. They were charged with holding correspondence with the French Directory, or its ministers;' but the truth of this accusation is strongly denied by Lord Cloncurry in his recently-published 'Recollections.' After being kept in durance for about six weeks, his lordship was set at liberty. In April 1799 he was again arrested under a warrant signed by the Duke of Portland, the then Home Secretary, which was issued under the authority of the Habeas Corpus Suspension Act; the charge being merely 'suspicion of treasonable practices.' On his arraignment before the Privy Council, he positively refused to answer any question while in custody. He was then committed to the Tower of London, where he remained for twenty-two months, until the expiration of the Habeas Corpus Suspension Act restored him to liberty. In the mean time, by the death of his father, he became Lord Cloncurry. After the peace of Amiens his lordship took the tour of the Continent; and while residing at Rome he formed, by purchase and excavation, a valuable collection of antiquities, which is now to be seen at his country mansion at Lyons, in the county Kildare. On his return to Ireland he lived as a retired but active country gentleman, and expended above 200,000*l.* in the improvements and decorations of Lyons; by which he afforded ample employment to a prosperous and happy tenantry. With Lord Wellesley, as lord-lieutenant, he was on terms of great intimacy, but still more so with the Marquis of Anglesey. In 1831, shortly after the commencement of Lord Anglesey's second viceroyalty, Lord Cloncurry was sworn a privy-councillor for Ireland; and during the same year he was raised to a peerage of Great Britain. Thus all his political hostility to English domination appears to have been forgotten; and we find, in the 'Personal Recollections of his Life and Times,' published in 1849, that his ardent temperament had gradually softened down to the ameliorated state of things. 'I have lived' (says he) 'during many years, seen many men, suffered and prevailed, been persecuted and honoured; and now, having laboured in my generation with at least a hearty desire to serve my fellow-men, I look at the past without even a passing feeling of unkindness, and at the present with, I trust, a reverential gratitude for the large share, vouchsafed to me by a beneficent Providence, of those three cardinal blessings of humanity, health, competence, and respect of men.' He died at his residence, Maretimo, Blackrock, near Dublin, in 1853, aged 80.

CLUB HOUSES (iv. 672). At no period of our social history were the Clubs of London held in more estimation, or more generally resorted to, than at the present. There are usually many thousand names on the candidates' lists for admission. Not long ago, the Athenæum, which consists of 1500 members, had 1600 candidates waiting their turn. This club possesses a library of 25,000 volumes, and reserves the sum of 500*l.* per annum for the library alone. The entrance fees to these clubs vary from eight to thirty guineas. The annual subscription is on the average six guineas; the lowest being five guineas, and the highest ten. The election is by ballot, and in some of the more exclusive and aristocratic clubs, a single black-ball excludes the candidate; but in general one black-ball in ten is the prohibitory number.

COACHES. [CARRIAGES, *Supplt.*]

COAL (iv. 677–84). The physical power which England derives from converting the latent power of its coal into active force, has been thus forcibly demonstrated by Professor Rogers of the United States:—'Each acre of a coal-seam four feet in thickness, and yielding one yard nett of pure fuel, is equivalent to about 5000 tons, and possesses therefore a reserve of mechanical strength in its fuel equal to the life-labour of more than 1600 men. Each square mile of one such coal-bed contains 3,000,000 tons of fuel, equivalent to 100,000 of men labouring through twenty years of their ripe strength. Assuming, for calculation, that 10,000,000 tons out of the present annual products of the British coal-mines, namely, 65,000,000, are applied to the production of mechanical power, then England annually summons to her aid an army of 3,300,000 fresh men, pledged to exert their fullest strength through twenty years. Her actual annual expenditure of power then is represented by 66,000.000 of able-bodied labourers. The latent strength resident in the whole coal product of the kingdom may, by the same process, be calculated at more than 400,000,000 of strong men, or more than double the number of the adult males on the globe.'

COAL FORMATIONS (iv. 688–94). That coal is of vegetable origin, as we have already shown, is receiving daily confirmation from the various discoveries which naturalists and geologists are constantly making in different parts of the world. For our more recent information we are chiefly indebted to the labours of Count Sternberg, Göppert, Brongniart, Humboldt, Buckland, Professor Lindley, and Sir Charles Lyell. The coal-measures (says Humboldt) contain not only fernlike cryptogamic plants and phanerogamic monocotyledons (grasses, liliacea, and palms), but also coniferæ and cycadeæ, amounting in all to nearly 400 species, as characteristic of the coal formations. It is also well known, that

in many parts of our own country accumulations of plants and wood are found, which at no very remote period were growing on the spot where they have been found deposited. Sometimes the wood is found so perfect, that the character of the plant may be discriminated; at other times the plant is so much decayed, and has undergone so great a chemical change, that its vegetable origin can scarcely be recognised. Among this latter class may be ranked the vegetable substance called peat, which is used as fuel in many parts of the country. Instances have been found when one-half of the trunk of a tree has retained its vegetable appearance, while the other half, from some chemical contact with other bodies, has been transformed into the purest jet, which, as is well known, is a carboniferous formation. The characters of cannel coal also bear a close analogy to the preceding. Thus we perceive that a succession of changes from vegetation to coal may be clearly traced. But, according to the opinion of many distinguished botanists, the vegetable deposits in the coal formations are such as could only have existed in the warmer latitudes. If, therefore, these plants are indigenous to the tropical climates, and their remains are now found in temperate or polar regions, it follows either that the temperature of the earth must have altered since their original stratification, or that they were drifted by water from some distant country. But the latter supposition, according to the opinion of the first geologists, is neutralized by the existing state of the vegetable remains; for they are sometimes found (says Mr. Witham) in a vertical position, with their roots fixed in a seam of coal, and presenting the appearance of having been embedded in the spot on which they were growing. We have, however, something like co-eval evidence of the origin of coal formations, and also of the interesting fact that the plants which contributed to these formations originally grew on the identical spot; and this evidence may be deduced from the appearance of the 'Great Dismal Swamp' of America, which is situated partly in North Carolina, and partly in Virginia. From east to west it is about twenty-four miles in width, and its length, from north to south, is about forty miles. Here vast numbers of trees lie immersed in the black mud of the morass; for the soil being loose or swampy, the trees are easily overthrown by the winds, and soon become buried beneath the swampy peat. *In fact*, the whole appears like one immense quagmire; and where any solidity of surface exists, it arises from a covering of vegetation which has then become fixed by their matted roots. When the trees are overthrown they soon become covered by water, and being kept in a state of moisture, they never decompose, but become transmuted, as it were, to a semi-metallic or carboniferous state. According to the opinions of Sir Charles Lyell, who visited this portion of the world in pursuit of geological science, the Great Dismal Swamp affords convincing evidence of the origin of the coal formations in primeval ages. After noting the generally-received opinion that the ancient formation of

coal was chiefly produced by plants which had not been drifted, but grew on the very spot, Sir Charles proceeds to say, that the growth of what is called sponge in such a swamp, and in such a climate as the Great Dismal, which covers so many square miles of a low swampy region, assists us greatly to conceive the manner in which the coal of the adjacent carboniferous rocks may have been formed. 'The heat, perhaps,' says he, 'may not have been excessive, where the coal measures originated, but the entire absence of frost, with a warm and damp atmosphere, may have enabled tropical forms to flourish in latitudes far distant from the line. Huge swamps in a rainy climate, standing above the level of the surrounding firm land, and supporting a dense forest, may have spread far and wide, invading the plains like some European peat mosses when they are burst, and the frequent submergence of these masses of vegetable matter beneath seas or estuaries, as often as the land sank down during subterranean movements, may have given rise to the deposition of strata of mud, sand, or limestone, immediately upon the vegetable matter. The conversion of successive surfaces into dry land, when other swamps supporting trees may have formed, might give origin to a continued series of coal measures of great thickness. In some kinds of coal the vegetable texture is apparent throughout under the microscope; in others it has only partially disappeared; but, even in this coal, the flattened trunks of trees of the genera lepidodendron, sigillaria, and others, converted into pure coal, are occasionally met with, and erect fossil trees are observed in the overlying strata, terminating downwards in seams of coal.'

From all our recent discoveries, it appears manifest that the vegetation of the primeval periods of the world's history exhibits forms which testify that many intermediate links must have become extinct in the scale of organic development. When many beds of coal are superposed over one another, the family and species are not always blended, being frequently grouped together in distinct genera; the lycopodiaceæ and certain ferns being alone found in one bed, and sigillariæ and stigmariæ in another.

In order to give some idea of the luxuriance of the vegetation of the primitive world, and of the immense masses of vegetable matter which was doubtless accumulated in currents, and converted in a moist condition into coal, 'I would instance,' says Baron Humboldt, 'the Saarbrücker coal measures, where 120 beds are superposed on one another, exclusive of a great many which are less than a foot in thickness. The coal-beds at Johnstone, in Scotland, and those in the Creuzot, in Burgundy, are some of them respectively 30 ft. and 50 ft. in thickness; whilst in the forest of our temperate zones the carbon contained in the trees, growing over a certain area, would hardly suffice, *in the space* of a hundred years, to cover it with more than a stratum of seven French lines in thickness.' According to Professor Ansted's 'Ancient World, the average thickness of the Lancashire coal is as much as 150 ft.; but Mantell's 'Wonders of Geo-

logy,' affords the best information of the thickness of coal measures in America and the Old Continent.

Of the coal formations in the colder latitudes of the north there have been many vague speculations; but it is stated by Humboldt, that near the mouth of the Mississippi, and in the wood hills of the Siberian polar sea, described by Admiral Wrangel, the enormous quantities of trunks of trees accumulated by river and sea-water currents, furnished many striking instances of the vast quantities of drift wood, which must have largely contributed to the formation of carboniferous deposits in the insular bays and inland waters. 'There can be no doubt,' continues Humboldt, 'that these beds owe a considerable portion of the substances, of which they consist, to grasses, small branching shrubs, and cryptogamic plants.' The association of palms and coniferæ, which have been indicated as being characteristic of the coal formations, is discoverable throughout almost all the stratifications of the earth's surface. But, in fact, the history of the primordial ages of the world's crust is the history of the vegetable creation, and of its various mutations.

There are various kinds of coal, possessing very different qualities, which, in all probability, have arisen from the vegetable materials that have originally contributed to their geological formation in primeval ages. We shall enumerate a few of them in alphabetical order.

Anthracite (Gr. ἄνθραξ carbon, or charcoal), is a variety of coal, consisting chiefly of carbon, which has the shining appearance of black lead. It emits little or no flame, but is much used as fuel for steam-engines. It is generally found in the primary strata of most countries, and especially in those situations where the coal comes in contact with the clay-slate of the coal-mine. Its specific gravity is about 1·400.

Bovey Coal is a kind of lignite or wood-coal, found at Bovey, in Devonshire, and chiefly exists in the rocks of tertiary formation, which would show that the comparative recentness of its vegetable formation had not allowed time for its perfect mineralization. It is of a dark brown colour, and of a yellow laminar texture. It consists of wood penetrated with bitumen, and often contains pyrites, alum, &c. When first dug out of the earth, the laminæ are flexible, but harder when exposed to the air. Its constituent parts are found, on analysis, to consist of carbon, 77·10; oxygen, 19·35; hydrogen, 2·54; and earthy matter, 1.

Cannel, or *Ampelites*, is a solid bituminous fossil, which is very hard, but easily inflammable, and burns rapidly with a clear brilliant light; but it is apt to fly to pieces when burning. It is of a jetty appearance, and takes a fine polish; hence it is used for making various toys and ornaments which look like jet. It is chiefly found in Lancashire and Scotland.

Culm is a variety of coal which possesses a considerable portion of argillaceous earth and sulphuric acid, with a moderate portion of petral. It burns with a bright flame, without being readily consumed.

Jet is a variety of coal, of a very hard and compact character, and of a deep glossy black colour, which is capable of a very high polish. The finer sort is used for the manufacture of trinkets and various ornaments. It exists in France, Germany, Spain, and other countries, and is found in detached kidney-formed masses of various sizes.

Kilkenny Coal is the lightest of all, and contains the largest quantity of asphaltum. It burns with less smoke and flame, and more intensely, though more slowly than cannel coal.

Pit Coal is the most common, though, perhaps, the most useful of all the other varieties. It is a compact brittle mass, which, according to Kirwan, consists of asphaltum or petral, mixed with argillaceous earth. It is seldom found to be calcareous, and is often mixed with pyrites.

Slate Coal is chiefly found near Purbeck, in Dorsetshire, where there are large quarries of it. It contains so much earth, and is of so laminar a nature, that it often looks like common slate.

Sulphurous Coal is generally known by yellow spots which resemble metal. It contains a great number of pyrites, on account of which it is apt to moulder and break when exposed to the air, after which water will act upon it.

(Lyell's *Geology*; Buckland's *Geology*; Lindley's *Fossil Flora*; Humboldt's *Cosmos*; Mantell's *Wonders of Geology*; Higgins' *Physical Condition of the Earth*, &c.)

COAL FIELDS (iv. 678-84). Of the vast coal-fields found in the geological stratifications of England, that of Whitehaven, in Cumberland, may be considered as the deepest and most extraordinary in the world. The mines are of such extent and magnitude, that in one of them alone upwards of half-a-million sterling was expended by the proprietors during the course of one year. The principal entrance to these mines is by an opening at the foot of a hill, which leads through the solid rock, to the deepest seam of coal. This descent winds through spacious galleries which intersect other galleries, and are supported by pillars 9 feet in height, and about 36 feet square at the base, the intervening spaces having been cut away, and these massy columns left for the purpose of supporting the ponderous roof. These mines are sunk to the depth of 130 fathoms, and their different branches extend under the sea to places where there is sufficient depth of water for the largest ships. On examining the geological formation of these vast mines, we find that there are three strata of coal, which lie one above another, at a considerable distance. These different strata are made to communicate through the means of pits or sunken shafts. The veins, however, are not always continued in parallel directions, but suddenly break off, when the miners are arrested by masses of solid rock; this formation is geologically called a *fault*. It appears as if one portion of the seam had suddenly sunk down, while the other retained its original position. In some places the depression is not more than 6 or 7 feet, while in others it is upwards of 100. These faults, or breaks, the miners call dykes; and when they meet with

them, their first object is to ascertain, in their own phraseology, whether the coal be cast up or down. If the latter, they have only to sink a shaft; but if the strata be cast up, there is considerable labour and expense attendant on the operation, and the miners are often compelled to carry forward a level or long gallery through the rock, until they again arrive at the disruptured stratum.

COAL TRADE (iv. 684-8). The history and statistics of this important branch of British commerce have already been brought down to the year 1845. Since that period amazing changes have taken place. The wonderful effects of the railway system on the coal trade are daily becoming more manifest. The old colliery trade of our eastern and southern coasts, which has been in the habit of employing about 30,000 sailors, and has been looked upon as the great nursery of the British navy, is probably destined ere long to be superseded by railway transit. The whole process of conveying coal from the north to the metropolis is undergoing a rapid transition. As Captain Law justly observes, in his evidence before the Railway Gauge Commission a few years ago, 'our mineral resources, both in coal and iron, are yet in their infancy. We have just touched on the fringe of our mineral wealth; and the great increase of railway communications will tend to develop these resources beyond all conception.' Subsequently, at a meeting of the South Midland Railway Company, Mr. Hudson observed, that of all kinds of traffic the railway conveyance of coal was the most productive, since they could always secure a full load. In ordinary luggage the risk of not ensuring even half a load is a great drawback to commercial profit; but when there was a certainty of procuring a full load at any time, and of finding a market at any of the leading towns through which the train might pass, the price at which they could be carried per ton might be calculated with tolerable accuracy.

From the period when Londoners, in the scarcity of wood, began to burn mineral fuel, the sea-borne coal enjoyed a complete monopoly of the market. Competition was absolutely impossible. The owners of these northern coal-fields, which enjoyed means of access to the German Ocean, were the only parties who could engage in the trade with any chance of success. Fortunately for all parties these fields were not only unlimited in their product, but were scattered over a vast range of country, communicating with the sea by many ports and outlets. It became impossible, therefore, to convert the class-monopoly into a close one, although many attempts were made in that direction. The proprietors of Northumberland and Durham, the merchants of Sunderland, Hartlepool, Newcastle-upon-Tyne, and other ports, if sheltered from external competition, competed with one another sufficiently to ensure a tolerably moderate range of prices, when the article arrived in the Thames. Yet the prices, at times, ranged immoderately high, and therefore every change which tends to reduce the cost of coal to the consumer must not only be a social blessing, but be productive of the greatest advantages to the commercial world.

Happily for the interests of society a powerful rival has sprung up in the system of railway conveyance. Most of the railways connected with the metropolis pass through some one or more of the coal districts, with which England is so abundantly provided. In Somersetshire, in Wales, in Staffordshire, in South Yorkshire, and various other directions, the article is now obtained in vast and continually-increasing quantities for conveyance to London by different railways. Some of these coals, in point of quality, cannot compete with the products from the northern coal measures; but in reduction of price the 'railway coals,' as they are designated, have always had the advantage. In fact the whole aspect of the metropolitan coal trade has undergone a complete change. Prices of all descriptions of the article have been remodelled, and the entire conditions under which the traffic has hitherto been conducted, especially by sea, are rapidly becoming arranged upon a new basis. From these alterations the consumer has profited considerably. A comparative statement of the London coal trade for 1850 and 1856 will show the changes which have taken place.

Not long ago an actual panic prevailed in the coal districts, caused by the rapid development of railway coal traffic. Inevitable ruin was predicted to the northern coal-pit owners and the fleets of Newcastle colliers, and doleful were the prognostics touching the pauperization of proprietors, the bankruptcy of merchants, and the annihilation of the 'nursery for British seamen.' The shipowners of Shields, and the seamen of the Tyne, memorialized the Government to take into consideration the ruin which threatened them, if coals were permitted to be conveyed by railway. At Sunderland a public meeting of the seamen employed in the coal trade was held 'to consider the expediency of memorializing the Lords Commissioners of Her Majesty's Treasury, to devise efficient measures for preserving the coal-coasting trade from ruin by the conveyance of coals from the north to London, and the other southern ports by railway.' A long memorial was unanimously adopted, in which it was stated that railways could convey coals to London from the collieries of Northumberland and Durham, at charges considerably lower than those for which ships could possibly be navigated, and that if this were carried into effect, it would entirely destroy the coal coasting-trade. But what has been the result? Rapidly as the transit of coal to London, along various lines of railway, may have augmented, the consumption of sea-borne coal, so far from diminishing, has not even ceased to increase. In 1856 the total quantity imported by sea, for the metropolitan market, was 3,119,884 tons; while, between January 1st and December 31st, 1855, the gross amount was only 3,016,868 tons, showing an increase of 103,000 tons. The 'deliveries,' or actual sales to consumers, have increased at a somewhat lower ratio. The augmentation of the year 1856 is more than 83,000 tons, as compared with its predecessor. There can be no question, however, that one of the greatest drawbacks, in the cheap supply of coals in the metropolis, has been the high freight from the Tyne to the Thames, which has hitherto materially in-

creased the price to the consumer. Each year it appears to have assumed a progressive increase. In 1835 it was 7*s.* 11¾*d.* per ton; in 1836, 8*s.* 7*d.*, and in 1837 it was 9*s.* 2¾*d.* To this were to be added the expenses of the coal-whippers, who were employed in emptying the vessels, the bargemen who navigated the craft into which the coals were emptied, the coal-heavers who had to empty the barges, and a host of other minor employés who swelled up the price to the consumer. Yet this was not the only evil. It has frequently happened that the ships have been detained in the river, and the crews kept in idleness, in consequence of the combinations into which the coal-owners, ship-owners, and factors entered. By the detention to which coal vessels have been exposed, the whole river, from Gravesend to the Custom House, has often been so crowded, that there has not been sufficient space for the free navigation of the river, consistent with the laws for its due regulation. It appears, moreover, that for every day that a vessel was detained in the river, it cost from 4*l.* to 5*l.*; and it has sometimes happened that some of them were detained six or seven weeks. It is not many years since a bill was laid before Parliament for the formation of a collier's dock; but owing to the opposition of the ship-owners, and others interested in the then existing regulations of the coal trade, the measure was abandoned. Its necessity has now been superseded by a new order of things, which railway transit is destined to introduce.

If we draw a comparison between the transit powers of the railway and ship conveyance, the odds are strikingly against the latter. For instance, a ship does not usually make more than eight voyages per annum, as a week or two is generally consumed between each trip in preparing the next cargo, and loading the vessel; while a railway train, owing to the great facilities with which the carriages are loaded at the pit's mouth, and emptied at the coal terminus of London, or any intermediate towns, can perform the same number of journeys in less than one month. Thus the period usually occupied in a single voyage with coals from the Tyne to the Thames and back again is one month; while the railway transit of a heavy load of 200 or 300 tons does not exceed twenty hours; and instead of the carriages being filled with useless ballast, on the return, they can be loaded with all kinds of heavy goods, at a cheap rate. But coals can be carried by railway at the rate per ton of eight miles for one penny, which from the northern collieries would be about 2*s.* 9*d.* per ton. A railway train would take about 300 tons, which would thus ensure 41*l.* 5*s.* each journey; and from the coal districts of South Yorkshire, Derbyshire, Staffordshire, Gloucestershire, Somersetshire, &c., they could be conveyed at 1*s.* 6*d.* to 1*s.* 9*d.* a ton; and at this time the average of coals in London is from 20*s.* to 25*s.* In a newspaper controversy, which took place a few years ago between the Lord Mayor of London and the combined coal-owners of the north, the Marquis of Londonderry thus estimated the various charges which constituted the sum total of a ton of coals:—

	£	s.	d.
Coal-owner	0	10	6
Ship-owner for freight	0	9	4
London charges, &c.	0	2	8
Coal-merchant's profit	0	12	0
	£1	14	6

The arrival and delivery of coals by railway conveyance is daily expanding. The aggregate of 1855 was about 1,161,000 tons, and for 1856, 1,221,000; showing an increase of 110,000 tons, or nearly 10 per cent. on the traffic of the first-mentioned year. As derived from different coal-fields, and conveyed by different railways, &c., the comparative tonnage of three years is exhibited in the following table:—

	1854.	1855.	1856.
Great Northern.	398,562	547,603	591,435
North Western.	271,011	339,657	443,672
Eastern Counties	167,956	145,327	126,775
Great Western.	84,592	80,950	73,048
South Eastern.	22,934	23,471	11,266
South Western.	....	827	103
Grand Junction Canal	32,153	23,251	25,295
Thames	...	...	106
Common Roads.	1,960	1,400	...
	979,170	1,162,486	1,271,700

Notwithstanding the prosperity of its rivals the prospects of the Newcastle coasting trade are encouraging; for the consuming power of London seems almost unlimited. In 1856, reckoning the supplies from every source, the metropolis used 214,000 tons more fuel than in 1855; and as the great city expands, so will the consumption increase. And it is gratifying to reflect that the extensive coal-fields of Staffordshire, Lancashire, Cumberland, Yorkshire, Wales, and other places, may pour forth their produce for the supply of the metropolis, as well as for the eastern, southern, and western districts of England, at half carriage price of the coal brought from the north. Thus as the abundance and cheapness of coal have largely contributed to the manufacturing prosperity and wealth of the respective localities where it is produced, so may the rapid transit of this useful mineral tend materially to elevate the social condition of the southern counties.

According to a statement published under the authority of the Corporation of London, in December 1857, there were conveyed by railway, to within twenty miles of London, during the year 1857, 1,206,775 tons of coals. The coals conveyed by canal, during the same period, to within thirty miles of London, amounted to 26,295 tons, showing an increase, when compared with 1856, of 894 tons. From the same report it appears that the sea-borne coals *viâ* the river Thames, during 1857, amounted to 3,133,449 tons, which were conveyed by 10,444 ships, showing a decrease, when compared with 1856, of 400 ships, and an increase in the coals of 13,575 tons. The total quantity conveyed to London, and within twenty miles thereof, in 1857, was 4,366,530 tons; showing a decrease, when

compared with 1856, of 25,054 tons. During the month of December 1857, the inland coals, brought by railway, canal, &c., and entered at the coal market, amounted to 102,876 tons.

But there is yet another important point to be noticed. Since the abolition of the export duty, the shipments of mineral fuel to foreign markets have enormously extended. Before 1842 this branch of commerce was comparatively insignificant. The total value of 'coals and culm' exported from every part of the United Kingdom, in 1841, was reckoned at little more than 600,000*l.* In 1848 the shipments exceeded a million, and in 1855 had augmented to 2,439,000*l.* Even this enormous expansion was exceeded during the year 1856, the returns of exportation, for eleven months only, being in quantity 5,524,000 tons, and in value 2,652,000*l.* sterling.

The *Newcastle Chronicle*, in an able article, written at the commencement of 1857, on the difficulties of sea-borne coal being able to compete with the railways, thus concludes:—'It is to the cheapening of cost in getting to market that we must mainly look for a means of successfully competing with the railways; and that screw steamers can and will eventually, with proper facilities, secure to this district its pre-eminence in supplying the metropolis with coals we have very little doubt. The quantity of coals carried to London by steamers in 1856 amounted to 238,597 tons, against 85,000 tons in 1855. The war and the high freights offering in some other trades have prevented their employment to a still greater extent. Only four or five screws were employed regularly all the year. The greatest number of voyages was made by the Ross, D. Mangles, which carried 36 cargoes, amounting to 23,205 tons.'

Looking at the whole coal trade of this country, it appears that there is now raised five times as much coal in Great Britain as in any other country, and it is estimated that there is in these isles more than 4000 square miles of coal-fields as yet to cut out; so that there is little fear of exhaustion. For instance, the extent of the Cumberland coal-field, including Westmoreland and Yorkshire, has an area of some 200 square miles. It has been worked for a lengthened period, and does not yet give any signs of exhaustion. But the Cumberland coal-field is one of the smallest, both in extent and thickness; for it is only 1-60th of the whole area of coal in the British isles; and while its workable thickness is only some 17 feet, the several seams of the South Wales coal-field are 100 feet thick, the thickness of the Lancashire coal is 150 feet, and in some of the Scotch coal-fields there is a workable thickness of 200 feet. It has been calculated that the single magnificent coal-field of South Wales, of 1200 square miles, would supply England with fuel for at least 2000 years, after the whole of our English mines are worked out. The coal discoveries in America also have been of late years on a most extensive scale. The three great fields are—the Ohio, 740 miles long and 180 wide, covering an area of 60,000 square miles, a surface greater than that of England and Wales; the Illinois coal-field, covering an area of 50,000 square miles; and the Michigan, occupying 15,000 square miles. Besides these, there are numerous anthracite basins in Pennsylvania and Virginia, the farthest being 100 miles from the margin of the Ohio coal-field. The anthracite field is 5000 feet deep, and contains 50 seams of coal; the bituminous coal-field of Ohio is 2800 feet deep. The working of these coal-fields is increasing very rapidly; 3,000,000 tons of anthracitic, and 1,000,000 tons of bituminous coal being raised annually. So that the coal trade of both continents will continue, for a long succession of ages, to form the great leading interest of commercial industry, and one of the most important agents in human civilization and national prosperity.

COCCOSTEUS (Gr. *κόκκος* a colouring berry, and *στέγος* a covering), a genus of fossil fishes, from the old red sandstone of Scotland, so named from the berry-like tubercles with which the plates composing its bony casement are dotted. It varies in length from one to two feet; and, from its peculiar shape, it has been appropriately compared to a boy's kite. Its teeth, instead of being fixed in the alveolar process or socket, are integral portions of the bone, like the teeth of a comb, and the mouth is supposed to have been placed vertically. Four species of this genus have been noticed. Their fragments frequently appear of a brilliant purple or blue colour, as the name *coccus* implies; and they are easily recognised from the contrast which this colour presents, when compared with the dull red tint of the sandstone rock, in which they are imbedded. (Craig; Milner.)

COCKBURN, RIGHT HON. SIR GEORGE, Admiral of the fleet, and Rear-admiral of the United Kingdom. He was the second son of Sir George Cockburn, and was born in London in 1772. He entered the navy as captain's servant in 1781, on board a frigate then commanded by Capt. Rowley. In 1787-8 we find him in the Termagant, 18, and the Ariel, 12. In 1791 he served in the Channel as midshipman of the Hebe, 28, under Captain Hood, and as master's mate in the Romney, 50, which was the flag-ship, in the Mediterranean, of Rear-Admiral S. C. Goodhall. In 1792 he was appointed acting lieutenant of the Pearl, 32; and the next year was confirmed in the Orestes, 18. After serving in the Britannia and the Victory, and taking the command of the Speedy sloop, he was appointed acting captain of the Inconstant, 36; and afterwards officially posted into the Meleager, 32, which he commanded, during the hostilities against Corsica, in 1795. In the following year he was transferred to the command of the Minerve of 42 guns and 286 men, where he remained till the peace of 1802, and signalised himself in numerous actions. Among other operations he bore a very active part in the battle off Cape St. Vincent, in 1797; was engaged in the hostilities against Malta; took, during the year 1800, three French privateers; and the following year captured and destroyed the Success, 32, and the Bavoma, 42. On the resumption of hostilities with France, Captain Cockburn assumed the command of the Phaëton, 38; and was subsequently employed in

blockading the Isle of France, where he frequently came in close collision with the enemy's batteries. In 1808 he assumed the command of the Pompée, 74; and on his passage to the West Indies, he captured Le Palade, 16. As commodore of the British squadron, he powerfully contributed to the reduction of Martinique, which thenceforward became a British colony. For this important service he received the thanks of both Houses of Parliament. On his return to England he was engaged in the expedition up the Scheldt, where he assumed the command, and was instrumental in the capture of Flushing. He afterwards proceeded to Cadiz, with the flag of Sir R. Keats, and effectually co-operated in the defence of that place. In 1812 he was promoted to the rank of rear-admiral. During the years 1813-14, he was engaged in active hostilities with the United States of America, against which he waged a destructive warfare, especially in the waters of the Chesapeake. In 1814 he entered the Potomac; and, ascending that river, in command of the Albion, 74, he frequently landed, at the head of a body of seamen and marines, sometimes in Virginia, and sometimes in Maryland, which that river divides. He thus destroyed, to the distance of ten miles from the two edges of the river, all the military posts and materials of war, in a very extensive range of country; and also captured and carried off large supplies of military and commercial stores. He next proceeded with his boats up the Petuxcut, in search of a powerful flotilla, under the command of Commodore Barney; but such horror did his name inspire, that the Americans, on being discovered, instantly set fire to their vessels, and effected their escape. In conjunction with Major-General Ross, he next planned an attack on Washington, in which he completely succeeded. After routing a body of 8000 men, he entered the city, and destroyed property to the value of nearly three millions of money. Through the whole detail of this gallant achievement, Sir G. Cockburn displayed as much judgment in the capacity of a soldier, as he had previously exhibited as a naval commander. After executing many other naval operations on the southern coast of the United States, to the great terror of the inhabitants, hostilities having terminated, he returned to England; but not without having fully established the naval superiority of Great Britain, which had, on many previous occasions, been called into question. For his many gallant actions on the American station he had been nominated a knight commander of the Bath. After the defeat of Napoleon at Waterloo, Sir George Cockburn was deputed to convey him to St. Helena; and appointed commander-in-chief on that station; but in 1816 he was superseded by Sir Pulteney Malcolm. Having in 1829 become vice-admiral, he was appointed commander-in-chief on the North America and West India station, from 1832 to Feb. 1836; and the promotion to full admiral took place in 1837.

The talents and services of the gallant admiral were not, however, confined to professional life. He entered upon the political arena as a politician and a statesman; and was rewarded with the confidence and highest honours of his sovereign. In 1818 he was created G.C.B., and appointed one of the Lords of the Admiralty. In the same year he was returned as M.P. for Portsmouth. He was out of office from 1830 to 1841, when Sir Robert Peel came into power. From that period, until 1846, Sir George was the senior naval lord of the Admiralty. In Nov. 1841 he became an admiral of the red; in 1847, rear-admiral of the United Kingdom; and in 1851, admiral of the fleet.

Of Sir George, it may be said that he was a true sailor, and as such was held in honour and respect by all who served under him. He was regarded by the Duke of Wellington as the first man in the navy; and by Sir R. Peel as the sheet-anchor of his department. Like the illustrious Nelson he sacrificed every feeling to public duty; and full of years and honours he descended to the tomb, with the consciousness that the deathless pages of history would immortalize his services and his worth. He died at Leamington Spa, in 1853, in his 81st year.

COD LIVER OIL, a term applied to an oil extracted from the livers of several species of the *Gadidæ*, or cod family. These oils are said to resemble each other closely in their medicinal properties. In this country the name is generally applied to the oil extracted from the liver of the common cod fish, *Morrhua vulgaris*, or *Gadus Morrhua*; a member of the order *Malacopterigii*, and which has of late years become so fashionable as a remedial agent in certain disorders. Dr. De Jough says, that the Norwegian oil is principally obtained from three species, viz. the dorse, *Gadus callarius*; the coal fish, *Gadus carbonarius*; and the pollack, *G. pollachius*; but chiefly from the first.

Three varieties of oil are described by continental writers, viz. the pale, pale brown, and dark brown; it is, however, often met with of a variety of shades between these, consequently no specific distinction can be made in regard to colour only.

The modes of extracting the oil from the livers vary. According to Pennant, it is procured in Newfoundland, by putting the livers into a cask, the bottom of which has been perforated and lined with a layer of spruce boughs; the boughs are pressed down, and the livers laid on them, and the whole exposed to the rays of the sun, when putrefaction takes place; the oil runs from the livers, and filters through the spruce boughs, into a vessel placed beneath the bottom of the tub to receive it. When thus prepared it is of a dark brown colour, owing probably to its containing some solid matters of the fish in a state of decomposition. It has a bitter and empyreumatic taste, and leaves a sensation of acridity in the fauces; its odour is empyreumatic and disagreeable in the extreme; by transmitted light the colour is greenish. At Newhaven, near Edinburgh, it is stated to be prepared by the fishermen, by the simple boiling of the livers, separation of the oil, and filtration through a towel containing a little sand. A third method of obtaining it is to subject the livers, contained in a suitable vessel, to the

heat of a stove, the temperature of which does not exceed 200°; the oil runs out, and may be collected and filtered: by this process a nearly colourless oil is obtained.

The principal constituents of the oil, according to Dr. De Jough, are an oleate and margarate of glycerine, possessing the usual properties; butyric and acetic acids; the principal constituents of bile, bilifellinic acid, bilifulvin, and cholic acid; a peculiar substance, termed Gaduin; and scarcely one per cent. of salts, containing iodine, chlorine, and traces of bromine.

At one time an opinion was entertained 'that the brown variety was possessed of more active qualities than the paler;' but nothing has been discovered in the former, by chemical analysis, to support this view; and the disagreeable odour and flavour render it very objectionable.

This oil appears to have been used as a popular remedy in various parts of Europe for some time, in cases of rheumatism and some other diseases, and is stated by Dr. Bardsley to have been held in great repute in Lancashire. It has been found most successful by medical practitioners in cases of rheumatism, scrofula, and phthisis; especially the latter, where it has occasionally been of surprising efficacy. The principle to which this oil owes its effect has not been satisfactorily settled. Some attribute it to the presence of iodine and bromine; but the quantity contained in it is too small to account for its activity, unless they exist in a state of combination which renders them peculiarly active. Dr. Pereira states, in his 'Materia Medica,' 'that this oil may be retained on the stomach, when all other devices fail, by the use of a small portion of common salt before and after the dose.'

CODRINGTON, ADMIRAL SIR EDWARD, G.C.B., the distinguished commander at the battle of Navarino. He was the third son of Sir Edward Codrington, of Dodington, in Gloucestershire, and was born in 1770. After the usual routine of education he entered the navy in 1783; and in 1793 was confirmed as lieutenant. In 1794 he was engaged in the celebrated victory gained by Lord Howe on the 1st of June. He was then lieutenant of the Queen Charlotte, the flag-ship of the gallant commander, and was entrusted with the duplicate dispatches of that important victory obtained over the French. He was shortly afterwards posted into the Babel of 22 guns, and was engaged in Lord Bridport's action with the French fleet off the Isle de Croix. In 1805 he was appointed to the Orient, of 74 guns, and was engaged in the important victory of Trafalgar, under Lord Nelson. In 1808 he obtained the command of the Blake, 74, and served under Lord Gardner, in the Walcheren expedition. During the years 1810-12 he was actively employed on the coast of Spain, and was present on shore at the defeat of the French, near Villa Lucca. On his return to England, in 1813, he was appointed a colonel of marines; and soon afterwards sailed to North America, in the Forth, 40. While on that station he was promoted to the rank of rear-admiral, and appointed captain of the fleet under Sir Alex. Cochrane, in the Tonnant, 80. He was actively engaged in the attack on New Orleans, on board the Havannah, 36, in which he had hoisted his flag; but, on the cessation of hostilities with the United States, he returned to England, and in 1815 was nominated a Knight Commander of the Bath. In 1821 he was promoted to the rank of vice-admiral. The most distinguished action of his life, however, and that for which his name is most generally known, was the battle of Navarino. Having been appointed commander-in-chief of the Mediterranean squadron in 1826, he hoisted his flag on board the Asia, 84. The battle of Navarino took place on the 20th of October, 1827, between the English, French, and Russian combined fleets on the one side, and the Turco-Egyptian fleet on the other. It ended in the complete defeat and annihilation of the Turkish forces, and led, eventually, to the independence of Greece. In this memorable conflict Sir Edward took a leading part. The Asia led the rear, and commenced operations against the enemy, whose united forces lay in the form of a crescent in the bay of Navarino. The Asia soon became hotly engaged in the thick of the conflict. After having disposed of two Egyptian men-of-war, she was exposed to a severe raking fire, which dismounted many of her guns, and carried away her mizen mast. Sir Edward Codrington was himself slightly struck; his watch being shattered in his pocket. Notwithstanding the obstinate resistance of the enemy the victory was complete. Out of a fleet consisting of eighty-one men-of-war, only one frigate and fifteen small vessels remained. For this distinguished service, Sir Edward was advanced to the dignity of G.C.B., while from the Emperor of Russia he received the Grand Cross of St. George, and from the King of France the Grand Cross of St. Louis. Yet, in England, there were many misgivings as to the policy of the measure; and the Duke of Wellington, in his official capacity, characterised it as an 'untoward event.' In 1831 Sir Edward was placed in command of the squadron of observation in the British Channel; and in 1839, having attained the full rank of admiral, he was appointed commander-in-chief at Portsmouth, which he held for the usual period of three years.

Having thus gone through the highest grades of naval honours, Sir Edward ventured on the political arena of life. In 1832 he was returned as one of the first representatives of the newly-created borough of Devonport. So popular was his parliamentary career, as a liberal politician, that at the general election, in 1835, he was again returned for Devonport by a large majority; and in 1837 re-chosen without a contest; but, on taking the command of the station of Portsmouth in 1839, he resigned his seat in Parliament. He died in 1851; and was interred in the family vault at St. Peter's, in Eaton Square, London.

CŒNOSIA (Gr. κοινος common), a genus of dipterous insects of the tribe Muscides, the larvæ of which usually live on mushrooms.

COGNO'MEN, the last or family name used by the Romans for the sake of distinction. Thus

to mark the different gentes and familiæ, and to distinguish the individuals of the same family, the more noble of the Romans had usually three names, the *prænomen*, the *nomen*, and the *cognomen*. The *prænomen* was placed first, and marked the individual; the *nomen* followed, and denoted the gens; while the *cognomen* was put last, and distinguished the familia. Thus in Publius Cornelius Scipio, Publius is the prænomen; Cornelius, the nomen; and Scipio, the cognomen. Sometimes a fourth name was added, called the *agnomen*, in order to mark some remarkable event or illustrious action. Thus Scipio, after his conquest of Carthage and Africa, received the agnomen of Africanus; and, on a similar account, his brother Lucius Cornelius Scipio was designated Asiaticus.

COINAGE, and COINING (iv. 724). From statistical returns, it appears that in England there were coined, *in gold*, during the year 1855, 8,448,482 sovereigns, and 1,120,362 half sovereigns; *in silver*, 831,017 florins, 1,368,499 shillings, 1,129,084 sixpences, 646,041 groats, 4,158 fourpenny pieces, 387,838 threepenny pieces, 4,752 twopenny pieces, and 7,920 pennies. The total value of the silver coined was 195,510*l.*, and the real cost or value of the metal 192,002*l.* No crowns or half-crowns appear to have been coined since 1852. The *copper* coinage of 1855 consisted of 5,273,856 pence, 7,455,837 halfpence, and 3,440,640 farthings—representing a value of 41,091*l.*, the purchase value of the copper having been 22,013*l.* In 1855, 199,564,903 ounces weight of worn silver coin was purchased at a nominal value of 621,550*l.*, the Mint value (5*s.* 6*d.* per ounce) being 553,581*l.*, and the loss by re-coinage 67,968*l.*

With these vast issues of the coinage, and the never-ceasing demands for fresh supplies, it becomes a very important question as to the annual diminution from wear and tear of the gold and silver currency of the country. Silver coins, from their constant use, and the perpetual friction to which they are exposed, are much more liable to diminution than gold. From careful investigation, it has been found that silver shillings, sixty-two of which are equal to 1 lb. troy when first issued, have been so much reduced, by constant wear, as to require seventy-eight of them to make up the 1 lb. troy; and, at another period, eighty-two were necessary to make a pound weight. In 1807, the Mint officers, (says the author of 'Novelties, Inventions,' &c.) 'wishing to ascertain how much the current coin had actually lost by wear, selected at random one thousand good guineas from a banker, and found that they had lost, on an average, 19*s.* per cent. in value. A hundred guineas from a shopkeeper's till had lost 22*s.* per cent. Two hundred half-guineas exbited a loss of 42*s.* per cent.; the smaller coins being subjected to more severe wear than the larger. Mr. Jacob, a great authority on the subject of precious metals, stated it as his opinion that, 'taking the average of all the gold coins in this country, and an average of all the hard usage to which the coins are exposed, each one bears an annual loss of about $\frac{1}{900}$ by friction, which is a little more than a farthing in the pound. In silver coins the loss is supposed to be five or six times greater, owing to the more increasing circulation of silver than gold, and to the less fitness of the metal to bear friction.' After making various experiments on the power of different metals to resist friction, it has been found that twenty-two of gold, and two of silver and copper alloy, which is the standard of the gold coin, was the best of all combinations for resisting the wear and tear of general circulation.

Coining of money is now reserved for the Crown, as one of the royal prerogatives. But, during the last century, copper money was extensively coined for the English Government, as well as for various foreign governments, and the dies cut by the most skilful artists of the day. When the government establishment was broken up, in 1850, there were, among the general collection, some of the most celebrated medals which had appeared in various countries during the reign of George III.; the dies by which these medals had been stamped; British copper coins, and the dies for them; many varieties of French copper coins, with the dies; and a great number of other coins, medals, and tokens. Birmingham still makes copper coins, by the ton weight at a time, for various countries. When Boulton and Watt commenced coining in 1787, they had eight cutting-out presses, and eight coining presses. On one occasion the firm coined many tons of five shilling pieces, for the British Government, from silver which had been obtained by the capture of a Spanish galleon. A troop of soldiers guarded the premises while the coining was in operation.

In France, it appears, that since the establishment of the decimal system in 1795, up to the 1st of January 1856, the gold and silver money coined in France amounted to the nominal value of 7,424,638,837*f.*, of which the gold coins represented 2,864,420,950*f.*, and the silver 4,560,217,887*f.* The gold coinage has thus been composed:— 5,507,400*f.* in coins of 100*f.*; 7,740,250*f.* in 50*f.*; 204,432,360*f.* in 40*f.*; 2,535,264,520*f.* in 20*f.*; 84,976,720*f.* in 10*f.*; and 22,499,700*f.* in pieces of 5*f.* The silver coinage comprised:—4,387,773,570 5*f.* pieces; 69,844,202 2*f.* pieces; 66,540,584 1*f.* pieces; 33,541,732 50*c.* pieces, and 2,517,709 20*c.* pieces. From 1719 to 1855 inclusive, the copper money coined in France amounted to 54 million francs; but the amount now supposed to be in circulation is little more than 14 million francs, in consequence of the old copper coins having been withdrawn from circulation.

In the United States, the coinage, during the year 1856, amounted to 14,346,762 dollars, comprising 11,074,388 dollars in gold, 3,245,268 dollars in silver, and 29,106 in copper; and composed of 25,876,288 pieces.

COINS, FOREIGN, VALUE OF. [MONEY.]

COLBURN, HENRY, proprietor of the *New Monthly Magazine*, the *Literary Gazette*, *Court Journal*, and other well-known periodicals. He was one of the most active and extensive publishers of the day; and carried the system of ad-

vertising to a greater extent than any other contemporary. He was intuitively a publisher; and most of our eminent writers and novelists of the day may attribute their rise to Mr. Colburn's bibliographical energies; among others, Lady Morgan, Sir Bulwer Lytton, D'Israeli, Ward, Theodore Hook, Captain Marryatt, James, &c. He was always liberal to his authors, and most punctual in his dealings. He died in Bryanstone Square in 1855, where he had retired on a very handsome competence—the result of his own indefatigable industry.

COLD AND ICE. It is one of the universal laws of nature, that as all bodies are expanded by heat, so they are contracted by cold; and although water, when congealed by excessive cold, appears to increase in bulk, and become specifically lighter, the cause is readily explained on the principles of crystallization—the word crystal originally signifying *ice*. Thus water in freezing crystallizes in filaments, which are uniformly joined at angles of 60° and 120°; and by this means a piece of ice, on minute examination, will be found full of air-bubbles, or small interstices, which of course contribute to the bulk, and decrease the specific gravity. It is this angle of crystallization which causes the ice to occupy a greater volume than if the filaments were parallel. To prove that ice contains a large portion of air, we have only to drop some small pieces of ice into a glass filled with hot water; and we shall perceive that as the ice melts, the air contained therein becomes disengaged, and air-bubbles will be seen to rise to the surface of the water, and then burst. That ice is lighter than water, is known from its swimming on its surface; and also from the fact that the bulk which water occupies, when turned into ice, is as nine to eight. Thus this apparent deviation from the laws of nature does not, in the least, alter the general proposition that all bodies are contracted by cold, and expanded by heat. But as to the general density of ice, it is harder and much more compact in the northern latitudes than in the more temperate ones. The ice of Spitzbergen and the Greenland seas is so hard that it is difficult to break with a hammer. It is related by M. de Bomare, that during the severe winter of 1740 there was constructed at St. Petersburg, according to the rules of architectural art, a palace of ice, 52 ft. long, 16 ft. wide, and 20 ft. high. The blocks of ice were quarried from the river Neva; and when built up, the different parts were coloured by sprinkling them over with water of different tints. To increase the effect, six cannons, made of ice, with wheels, &c., of the same material, were placed before the palace; and a hempen ball was fired by one of these cannons, through a board two inches thick, at a distance of nearly sixty yards; nor did the ice cannon burst from the explosion. From the excessive cold which universally prevails at the poles the water is converted into solid masses of ice, similar to the *hardest rocks*; and it may be formed by the chisel of the statuary, like stone or marble. This great solidity of ice at the poles is caused by the very low temperature

of the atmosphere during the absence of the sun's rays; and there can be no doubt but that the eternal masses of ice at the north pole are the principal source of the coldness of our winters, and that this low temperature is conveyed to our more temperate latitudes by the vast strata of cold air blowing from the north. The ice at each pole of the earth forms an immense cupola, the thickness of which, beyond the 60th degree of latitude, is several hundred feet. Captain Cook could never approach nearer the south pole, where there is no land, than the 70th degree of latitude, or about 1500 miles, although he had coasted round it for a whole summer. In the northern part of the Russian territory, the temperature of the atmosphere is sometimes sufficiently low to freeze mercury, or 71° below the freezing point of water. In the northern latitude the thermometer frequently falls to zero, or 32° below freezing point. At Hudson's Bay it has been known to sink 50° lower. It is related (in Black's 'Chemical Lectures') that some Academicians, who made a journey to the northern end of the Baltic, wintered under the polar circles; and the cold was so intense, that if at any time they had occasion to open a window or door, the humidity of their breath, though confined in the air of the house, was condensed, and frozen into a shower of snow. When they ventured to breathe the cold air, their lungs were violently affected, and felt as if they were being torn asunder. The thermometer fell to 33° below zero; and they frequently heard the rending of the timber around them by the expansive power of the frost on the fluid contained in the pores of the trees.

Cold, like fire or heat, is difficult of definition; and perhaps it is best known by its effects. The sensation of cold and heat arises from the natural tendency which the latent caloric of all bodies has to diffuse itself equally through those bodies within the reach of its influence. Thus, when we place the hand upon a cold substance, a portion of the caloric leaves the one, to unite itself with the other; and this we call the sensation of cold. If, on the contrary, the hand be placed on a hot substance, part of the caloric, or heat, leaves the heated body, and enters the hand; and this produces the sensation of heat. Thus, whatever are the properties of heat, those of cold appear to be directly the reverse. Cold contracts the size of bodies, and heat increases it. Cold condenses matter, and gives strength to the mutual cohesion of its molecules, or parts; while excessive heat tends to dissipate them. Fluids also contract with cold, until they begin to freeze, when they dilate, and occupy a larger space. Hence it is, that a fluid, when frozen in a full vessel, will burst it; that water pipes, by the expansion of the frozen water, will crack. Even musket barrels, bombs, and cannon have thus been burst. It is owing to the expansion of water in freezing, that during intense frosts, rocks and trees are riven, or burst asunder; for it is calculated that a sphericle, or little globe of water, expands in freezing with a force equal to the resistance of many tons' weight. Attempts have been made to prevent this expansion, by driving an iron plug into

the orifice of a bomb-shell containing freezing water, when the plug, though two pounds in weight, was forced from the mouth of the shell, and projected several hundred feet with great velocity. In other experiments the shell actually burst from the expansive form of the freezing water.

There are many curious phenomena connected with the formation and solution of ice. Thus water congeals in a glass which is set in salted snow, on account of the intense cold communicated to it. If only the lower part of the glass stands in snow, the congelation will commence at the bottom instead of the surface, and proceed upwards. During this process the glass will not readily spring or crack; but if it be entirely covered with salted snow, with the view of promoting congelation all over, the glass is liable to break, because the regular discharge of air is thus prevented. It is by the assistance of snow that various liquids are cooled and frozen. In India, where it scarcely ever freezes naturally, they have a very ingenious method of obtaining ice. The natives dig pits in the ground about 2 or 3 ft. deep, which are lined with Indian corn, or dried sugar-canes. They then place over the excavation shallow dishes made of very porous earthenware filled with soft water. The dishes are deposited in the evening, and in consequence of the evaporation from the outsides of the dishes, a considerable portion of the water is found frozen next morning. Before sunrise, the natives collect the ice, and deposit it in an underground cellar, lined with straw, where, in consequence of its own accumulated cold, it freezes into a solid mass. As to the solution of ice, it sooner melts in water than when exposed to air of a similar temperature; and sooner in water a little warm than near the fire, where there may be more heat. It melts quicker on some substances than on others; for which a philosophical reason cannot always be assigned. For instance, it melts sooner on a silver plate than on the palm of the hand; and also on a plate of copper than on any other metal. When placed in a vacuum, it sooner melts than when exposed to the atmosphere. In the former it will only occupy four minutes, while it takes twenty minutes to dissolve it in the atmosphere.

(Boyle's *Observations on Cold;* Ellis's *Voyage to Hudson's Bay;* Pierre's *Studies of Nature;* Parkes's *Chemical Essays.*)

COLERIDGE, HARTLEY, eldest son of the celebrated poet Samuel Taylor Coleridge, and cousin of Henry Coleridge; both of whose memoirs have already appeared in our pages (iv. 739–41). He was born in 1797; and appears in some degree to have inherited the poetic talent for which the name of Coleridge has been so distinguished. He was the writer of many agreeable poems of considerable merit, and also the author of 'Biographies of Northern Worthies,' which was published in 1833. He likewise brought out a volume of poems, which was published at Leeds during the course of the same year, and added materially to his reputation as an original and pleasing writer. His 'Worthies of Yorkshire and Lancashire,' a volume of which was produced in 1836, was the portion of a work intended to have been carried on to a much greater extent. It contained the lives of the most distinguished persons born in or connected with those counties; and more especially of Thomas Lord Fairfax, Roger Ascham, Sir Richard Arkwright, William Roscoe, Andrew Marvelle, Capt. J. Cook, Congreve, Fothergill, and others equally distinguished. The life of Hartley Coleridge was not attended with any striking incidents. After going through the regular course of a liberal education, he was elected to a fellowship of Oriel College, Oxford, when Dr. Copleton was provost; but it does not appear that he went through the probationary year. During his literary career he was a large contributor to the pages of 'Blackwood's Magazine' and other periodicals; but his general habits being quiet and retiring, attended with occasional eccentricities of manner, he does not appear to have entered much into the social and busy world. He died at Rydal, in Westmoreland, in 1849, and was unostentatiously interred in Grasmere churchyard.

COLIBER'TI, among the Normans a kind of tenants in soccage, or villeins, who had been manumitted. They were of a middle condition, between the serfs and freemen, and eventually became a numerous class. They are frequently mentioned in Domesday. (Du Cange.)

COLISE'UM, or COLOS'SEUM, a vast elliptical amphitheatre at Rome, begun by Vespasian, and finished by Titus A.D. 80. It was 1600 ft. in circumference, and capable of containing 100,000 persons. Nearly one-half of the external circuit still remains. It consists of four tiers of arcades, adorned with columns of four orders, the Doric, Ionian, Corinthian, and Composite. It is generally considered as the most stupendous work of the kind of which antiquity can boast.—*Coliseum* is also the name given to a large public Rotunda in the Regent's Park; on the interior dome of which is a fine panoramic view of London, as seen from St. Paul's, which shows not merely all the principal streets in the city, and every public edifice, but some section or portion of every house which is not concealed by larger buildings. Beyond this, and in the background of the picture, is seen a prospect of the whole country surrounding the metropolis, to an extent, in some directions, of thirty miles. Some idea may be formed of the scale upon which the design is executed, from the fact that one single building represented—the new Post Office—contains nearly 300 square feet of painting; and the whole is delineated with such nicety, that not a frieze, or even the plinth of a column is omitted. The Coliseum being more than 150 ft. in height, an ingenious species of machinery is used for the purpose of raising the spectators from the foundation, and saving them the trouble of ascending the great staircases. The machinery which performs this elevation is infallible, but very simple. The power employed is that of water; so contrived as to proportion its strength to the number of persons—few or many—who may be in the chamber at the time when it is to be raised, each individual that enters, adding, involuntarily,

as he passes through the door, a force to the raising power equivalent to his own weight. At a given signal the apartment then rises: the panorama being all the while invisible to the spectator; until, at length, arriving at the first platform, he seems to stand on what is called the iron gallery of St. Paul's Cathedral; with the great dome, the turrets, and all those parts of the church which are visible from such a position, immediately below him; and the city of London, with its various great features, the river, the bridges, squares, the suburbs, &c., spreading on all sides, and in every direction around.

In the lower portions of this colossal edifice there is a large and commodious theatre for concerts, lectures, &c., and also representations of Swiss scenery, mountain torrents, stalactite caverns, conservatories, fountains, &c., which all contribute to render the Coliseum a place of great public attraction.

COLLAR OF SS., a kind of insignia, or mark of honour, worn by nobles, judges, knights, and others. According to Sir John Fenn, these collars, in the fifteenth century, were considered as ensigns of rank, of which the fashions denoted the degrees; and they were made of gold or silver, according to the rank of the wearer. It is related that this emblem of honour was taken from Simplicius, a Roman senator, who suffered martyrdom under Dioclesian. Hence it was that the society of St. Simplicius wore silver collars of double SS., on which were engraved the twelve articles of the creed. The image of the patron saint usually hung from the collar. (Dugdale; Fosbroke.)

COLLIER, REAR-ADMIRAL SIR FRANCIS AUGUSTUS, Commander-in-chief of the East India Station, and one of the most experienced admirals of the British service. He was the third son of Vice-Admiral Sir George Collier; and entered the navy, as a first-class volunteer, in 1794, on board the Magnanime, 44. He was afterwards attached to the Vanguard, 74, the flagship of Nelson, and bore a distinguished part in the battle of the Nile, Aug. 1798. He was afterwards engaged in various important naval operations, and during his whole career he served no less than thirty-three years on full pay. In 1812 he became flag-captain to Sir Francis Laforey, in the Dragon, 74, and afterwards commanded the Grampius, 50, in the West Indies and China. Being entrusted, in 1819, with the command of the naval portion of the expedition fitted out for the purpose of crushing the pirates of the Persian Gulf, he there rendered the most important services. The head-quarters of the freebooters were captured, their fortifications destroyed, and all their piratical armaments annihilated. For his various services he was nominated, in 1815, to the rank of C.B.; knighted in 1830; made a K.C.H. in 1833, and appointed, in 1837, a naval aide-de-camp to the queen. He was also a knight of the Persian order of the Lion and the Sun. In 1841 he was nominated captain of the William and Mary yacht, and superintendent of the Woolwich dock-yard; which appointment he retained until nominated, in 1846, commodore and commander-in-chief of the Channel squadron, with his broad pendant in the St. Vincent, 120. He was promoted to the flag-rank in the November of the same year. In 1848 Sir Francis Collier was appointed to the command of the East India Station. He arrived at Hong Kong in the following year, and from thence sent out an expedition for the suppression of the pirates of the Indian Seas, in which he was completely successful. Unfortunately, however, the health of Sir Francis had been for some time on the decline; and he expired at Hong Kong, on the morning of the 28th of October, 1849.

COLLO'DION, an ethereal solution of gun cotton, or pyroxylin, formerly employed in surgery, and now consumed to a great extent for photographic purposes. When well prepared it possesses very great adhesive properties, to such an extent indeed, that it is stated by Dr. Ure, 'that a piece of linen or cotton cloth covered with it, and made to adhere by evaporation to the palm of the hand, will support a weight of twenty or thirty pounds, and that its adhesive power is so great that the cloth is commonly torn before it gives way.' It is rather remarkable that the purest gun cotton, or that which possesses the most explosive properties, is the least adapted for the purpose of making collodion, it being nearly insoluble in ether. That best suited for this purpose, and which is readily soluble, is prepared by means of nitrate of potash and sulphuric acid; it retains a trace of sulphuric acid, is less inflammable, and leaves a carbonaceous residue after explosion. The solvent power of the ether is increased by the addition of a little alcohol.

COLO'NUS, in the feudal ages, a term applied to those husbandmen who were bound, at certain times of the year, to plough the lord's land; from which service the word *clown* was doubtless derived.

COLOPH'ONITE (Gr. *resin-coloured*), a brown-coloured variety of the dodecahedral garnet, chiefly found in Norway; and consisting of silica, 37·0; alumina, 13·60; lime, 29·00; oxide of iron, 7·40; magnesia, 6·50; oxide of manganese, 4·00; water, 1·00.

COLOURED FLAMES. Many inflammable bodies, when ignited, burn with peculiarly coloured flames. Alcohol burns with a pale blue flame, which is scarcely visible in bright daylight; carbonic oxide gas, and sulphur, both burn with a beautiful blue colour. Copper wire communicates a green colour to flame when heated in it. Potassium yields a beautiful purple flame when heated in the air, and sodium burns with a yellow flame. Several substances communicate peculiar colours to the flame of alcohol. Boracic acid imparts a green tint; so do the cupreous salts; the soluble salts of baryta, and nitrate of potash, a yellow; and those of strontia communicate a beautiful rose tint. The nitrate of this last metal is one of the compounds used for the production of the beautiful crimson fire seen at theatres and pyrotechnic displays.

COL'UMBITE (so called from having been discovered in America), a mineral of a duff brown or dark greyish colour, called Tantalite; being a

combination of the oxide of tantalum with manganese and the oxides of iron. This mineral occurs in small, shining crystals, which have the form of quadrangular striated crystals.

COLYMBETES (Gr. *a diver*), a genus of coleopterous insects, of the family Carnivora, and tribe Hydrocanthari.

COLYM'BUS (Gr. *a diving bird*), a genus of the Anatidæ, or Duck family, called Divers. The feet are partly webbed, and partly pinnated; and they dive for the fish on which they feed, as the name implies.

COLYM'PHA, a kind of diving-bell mentioned by Jerome, in which one Alexander descended to the bottom of the ocean. It is related that divers, in the time of Aristotle, used a sort of kettle, which enabled them to continue some time under water. Therefore the alleged invention of the diving-bell, in 1838, was merely its re-appearance in Europe. (*Nuttall's Class. Dict.*)

COMMENDA'TUS, in the feudal ages, one who lived under the patronage or protection of some great man, like the clients of the Roman Patroni. There were different kinds of feudal service, as predial, personal, or voluntary; and those who placed themselves voluntarily under the protection of any feudal lord, or great man, were designated *Commendati*. The term is frequently met with in Domesday. (Du Cange.)

COMPITA'LIA, Roman festivals held in honour of the Lares, or household gods. They were first instituted by Tarquin, and celebrated in the months of January and March. (Varro.)

COMPOSING MACHINE, a mechanical contrivance for enabling compositors to put together the printing types more expeditiously than by the ordinary process. Various attempts have been made to carry this desirable object into practice; and many different kinds of composing machines have been exhibited to the public, and even brought into working operation, though not generally adopted. Some few years ago the attention of the printing trade was much attracted towards two rival machines, one invented by Messrs. Young and Delcambre, and the other by Capt. Rosenberg. They were both highly ingenious, and were constructed with key notes, on the principle of the pianoforte. They are thus described by the author of 'Novelties, Inventions,' &c.:—'In these two machines there is a key-board on which the compositor plays; he has not to deal with flats and sharps, and naturals, but with the letters of the words transmitted to him by the author. To produce the word "industry" (for example), the compositor, instead of dipping his fingers into eight little cells, presses his fingers on eight different keys of his silent pianoforte. What, then, is the result? In Young and Delcambre's machine the key moves a lever; the lever pushes a type out of a little receptacle; the types slide down an inclined plane into a funnel or spout, and thence into a box, where the compositor takes them up, and arranges them in his composing-stick. In Rosenberg's machines the key detaches a type from a vertical rack; the types, when detached, range themselves on an endless bell; they leave the bolt and range close together in a receiver; and when one line-ful is thus formed the machine rings a bell, and the compositor takes away the line of type, and leaves room for another. In the one, the types require to be distributed in the same piece-meal way as in ordinary composing; while Rosenberg's machine was accompanied by another for effecting the distribution also. Rosenberg's machines were therefore more complete than that which was invented shortly before them; and very high anticipations formed of their value. But these anticipations have not been realised.'

At the National Exhibition of Industry, in Hyde Park, there was a composing machine exhibited, the invention of M. Sorenson, of Denmark, which appeared like two circular bird-cages, one placed over the other; the upper cage being for the distribution of type, and the lower one for composing it. As far as the apparatus can be understood, there was a sliding plate, which had a perforation for each cage, the one for distribution so formed as to admit one kind of type-letter only; and as every type had side notches differing from the others, the proper types slided by degrees into the space allotted for each peculiar letter. The other cage was for composing; and this was effected by a set of keys acting upon a number of springs which released the type in a way somewhat similar to those just described.

Some short time ago, M. Beniousky, the author of 'Phrenotypics,' exhibited a composing machine, which consisted of a vast number of small orifices, from which the different types projected; and these types were taken out and set up with a minute pair of pliers. They were conveyed to their respective orifices by means of slanting tubes, through which they were conducted to the position in which they were seen by the compositor. The projector succeeded in establishing a company to carry his invention into practical operation; but it does not appear to have been commercially successful.

COMP'TONITE, a mineral which occurs among the vesicular lavas of Mount Vesuvius, in association with mesotype and other minerals. It appears in white translucent crystals, and its primary form is a rectangular prism. It was so named in honour of Lord Compton, Earl of Northampton.

CONDER, JOSIAH, editor of the *Eclectic Review*, and the *Patriot* newspaper, and author of numerous works, which have contributed to establish his reputation, especially among the dissenting communities. He was born in London, in 1789; and at an early age appears to have manifested that literary taste and poetic genius, which his varied works subsequently displayed. Among others may be mentioned his 'History of Protestant Nonconformity,' his 'Modern Traveller,' his 'Dictionary of Ancient and Modern Geography,' Analytical and Comparative Review of all Religions,' 'Star in the East,' &c. He died in 1855.

CONFERVA'CEÆ, a natural order of water-plants. [ALGÆ.]

CONI'DEA (from *cone*), a genus of Mollusca, with conical-shaped fusiform shells, of the subfamily Columbellinæ.

CON'ILITE (from *cone*), a genus of fossil Cephalopods, the shell of which is conical, and slightly curved.

CONI'NÆ (*cones*), a sub-family of the Wing-shells, or Strombidæ, the shells of which are coniform, and the spire very short and pyramidal.

CONNAUGHT, Province of, in Ireland (iv. 858). According to the census of 1851, the population of this province was 1,012,007. It is divided into the counties of Mayo, Galway, Sligo, Leitrim, and Roscommon; and the population of each county is given under the respective heads, where the population of the principal towns, Galway, Roscommon, Sligo, Carrick, Castlebar, Tuam, Ballinasloe, Athlone, &c., is also given.

CONSUA'LIA, Roman festivals instituted by Romulus, in honour of Neptune.

CONTORNIA'TI (Ital. *contorni* the contours of a picture), in Numismatics, the name given to certain bronze medals supposed to have been struck in the periods of Constantine the Great and his successors. They are marked with peculiar furrows, and contain the figures of emperors and other distinguished characters. Their uses are not quite certain; but it is generally supposed that they were intended for tickets of admission to the public games of Constantinople and Rome.

CONVALLA'RIA (Lat. *convallis* a valley), a genus of Endogenous plants, of the order Liliaceæ, of which that beautiful and delicately-scented flower, the lily of the valley, is a type.—*Convallarites* is the name of a genus of fossil plants found in the red sandstone of Sulzbad, supposed to have belonged to the order Liliaceæ.

CONVERSAZIO'NE, a meeting or re-union of several persons for social or literary objects. The term is of Italian origin, and in its primitive acceptation simply means *conversation*—the Italian termination *i* forming the plural *conversazioni*. But in the course of time the word assumed the more extended signification in which it is now used. We have some resemblance to these conversazioni in the philosophic meetings of old in Greece and Italy, where, in the classic groves of Academus, a Plato reasoned, or a Tully spoke; and again, in that golden era of Italian art, when

'A Raphael painted, and a Vida sang.'

In the course of time, however, these intellectual meetings appear to have degenerated, especially in Italy, and to have become mere assemblages of the fashionable world, where intellectuality and ratiocination were sacrificed to the tinselled amusements of the aristocracy, or to the ridiculous vanity of mere personal display. 'Conversazioni (says Mr. Moore) are evening parties held at Rome, where persons of both sexes meet,—not for amusement or instructive conversation, but in order to see and be seen, and pay transient compliments to each other.' In France these conversazioni have been adopted under the name of SOIREES,—a word which literally signifies 'evenings, or evening parties,' and which, from the brevity of its pronunciation, appears to be coming into fashion in this country, as applied to Conversazioni. They have of late years become very general in London—not only in the private mansions of fashionable life, but amongst the numerous literary and scientific associations with which this great metropolis abounds. Of these associations, the one which stands the most pre-eminent is the Royal Society, whose meetings are held in Somerset House. Here a kind of conversazione or soirée takes place every Thursday evening during the winter season. After the reading of a paper on some philosophical or scientific subject, the members retire to the library; and while partaking of tea and coffee enter into conversation on the subject of the paper previously read, or on any articles or works of science which may be lying on their tables. Similar meetings are also held by the Society of Antiquaries, who meet under the same roof. We likewise find that at the Royal Institution in Albemarle Street, at the Russell and London Institutions, and at numerous others of a minor but not less useful character (Crosby Hall, Islington, Marylebone, Southwark, &c.), these conversazioni are conducted with great spirit and éclat.

It is at these meetings that literature and science unionize themselves, as it were, with all the pleasing socialities of life. By the collections of articles of vertù, antiquity, science, or art, and by the reading of original papers, conversation, and music, its members become united, at stated periods, in one general focus of friendly community; where all may be amalgamated under one roof, on the pure footing of social equality; and where the rough energies of manly intellect may be thus softened and refined by the amenities of the social circle.

(Nuttall's *Lecture on Literary Soirées.*)

CONYBEARE, The Very Rev. WM. DANIEL, Dean of Llandaff, F.R.S., &c., was born in 1787. He was the grandson of the Rev. Dr. Conybeare, Bishop of Bristol, and brother of the Rev. John Josias Conybeare, Professor of Anglo-Saxon and of poetry, in the University of Oxford. Dean Conybeare was educated first at Westminster, and afterwards at Christ Church, Oxford, where he was a contemporary fellow-student with Sir R. Peel, Bishop Gilbert, Archbishop Whately, and other distinguished characters. Soon after taking his degree at Oxford he entered upon the pursuit of geology, the science with which his name is so intimately associated. In the year 1814, his first communication was made to the 'Transactions of the Geological Society,' of which body he was one of the earliest members. Into the study of the then new science of Geology he entered with the utmost ardour, as an associate of Buckland and Phillips. His first paper in the 'Geological Transactions' is a tract on the origin of a remarkable class of organic impressions occurring in the nodules of flint, in the course of which he demonstrated that these substances were not, as was supposed, fossil corals, but produced by the infiltration of silicious matter into shells, the calcareous matrix of which has since perished. In 1816 he read a paper 'On the Geological Features of the North-East Coast of Ireland.' A disputed question respecting the constitution of

certain porcellanic schistous rock, full of ammonites, at Portrush, was considered to have been set at rest by the investigation on this occasion. The structure of this rock had been brought forward as evidence to show that basaltic rock generally had been in a state of aqueous solution or suspension. At this period the discoveries of new marvels in geology were matters of monthly occurrence. The remains of one large animal had been discovered and arranged, and had been styled by Mr. König, of the British Museum, 'Ichthyosaurus,' when Mr. Conybeare, in examining the collection, that had been formed by Colonel Birch of Bristol, of fossil remains taken from the lias in the vicinity of that city, came upon some bones, which were taken at first to be those of the crocodile. Further inspection, however, satisfied him, that the resemblance to the skeleton of a crocodile was only an analogy, and not an identity of genus. In conjunction with Mr. De La Beche, the matter was fully investigated, and a memoir was drawn up, and read before the Geological Society, announcing the discovery of the new animal, on the 6th of April, 1821. Hitherto nothing but dislocated fragments had been discovered, amongst which was a mutilated head, in the possession of Mr. Thomas Clarke, from the lias near Glastonbury; but Mr. Conybeare's skill in comparative anatomy was sufficient to enable him to construct the entire skeleton; and from the circumstances of the animal approaching more nearly to the nature of a crocodile than to that of an Ichthyosaurus, it was called by its present name of Plesiosaurus. From a still more perfect skeleton found at Lyme, all the early theories were verified, and a complete description was subsequently delivered. The discoveries confirmed Mr. Conybeare's conjectural restorations to a remarkable degree of nicety. About this period Messrs. Buckland and Conybeare laid before the Geological Society 'Observations on the S. W. Coal District of England.' In the year 1822, Mr. Conybeare published his 'Outlines of the Geology of England and Wales,' founded upon a small treatise, published by Phillips, in 1818, called a 'Selection of Facts,' &c. The greater part of this elaborate and comprehensive work, a marvel of compilation for its day, was written by Mr. Conybeare. In 1836 he was instituted to the vicarage of Axminster, Devon, of which rectory he was lessee from two prebendaries of York. He thus became personally connected with the town that was the birthplace of his friend and *collaborateur*, the late Dean of Westminster. In 1836 he was appointed Bampton Lecturer to the University of Oxford. During his residence in Devonshire, the remarkable occurrence of the large landslip between Lyme and Exmouth took place, in the winter of 1839, which called forth from him a geological memoir, accompanying several admirable drawings of the scene by W. Dawson, Mrs. Buckland, and others. Mr. Conybeare was also a contributor to the 'West of England Journal of Science and Literature,' and to other periodical works. In 1847, at the instance of Dr. Copleston, then Bishop, he was instituted to the deanery of Llandaff, and his later years were actively employed in the superintendence of the repairs of Llandaff Cathedral. His geological tastes were gratified by a visit to the island of Teneriffe, about the year 1851 or 1852. He died in 1857.

COOPER, BRANSBY BLAKE, senior surgeon of Guy's Hospital, and nephew of the illustrious surgeon, Sir Astley Cooper. He was born at Great Yarmouth, in 1792. At an early age he entered the navy, as a midshipman, in the Stately, 74, under the especial care of the first lieutenant, afterwards Admiral Fisher. A naval life did not, however, agree with his delicate constitution; and he again returned to school. On the completion of his education he devoted himself to the study of medicine and surgery, and remained for two years in the Norwich hospital. In 1812 he entered the army as assistant surgeon in the Royal Artillery, and soon became actively employed in the Peninsular war. In his surgical capacity he was present at the battles of Vittoria, the Pyrenees, Nivelle, Orthes, the siege of St. Sebastian, and the final battle of Toulouse. On his return to England, he pursued his medical studies with great assiduity; and for three years acted as demonstrator of Anatomy at St. Thomas' Hospital. About this time he published a valuable treatise on the ligaments. In 1823 he was admitted a member of the Royal College of Surgeons; and in 1848 he became a member of the Council. His practice at this time was very extensive; and he was deservedly considered as one of the most eminent and skilful surgeons of the day. He largely contributed to the promotion of medical science by the productions of his pen. He was the author of 'Surgical Essays,' on the growth and formation of bone, on fractures, dislocations, &c.; and also wrote a separate work on fractures and dislocations. He also made some valuable contributions to the advancement of surgical knowledge, in the Guy's Hospital Reports, and other publications. He was likewise the author of Sir Astley Cooper's biography, which he wrote as a testimony of veneration for the memory of his distinguished uncle. He died in 1853.

COOPER, JAMES FENIMORE, of Cooperstown, New York, the distinguished historian and novelist of America. He was the son of Judge William Cooper, the descendant of an English ancestor, who settled at Burlington, New Jersey, in 1679; where the subject of our memoir was born, in 1789. He was educated at Burlington, but completed his studies at Newhaven, where he entered Yale College in 1802. In 1805 he entered the navy; and served his probation of six years as a midshipman; and perhaps to this circumstance may be attributed his great skill and liveliness of imagination in depicting the various scenes interspersed in his 'Tales of the Sea,' and other works of a similar character. He commenced his career as a novelist, in 1821, by the publication of 'Precaution;' but this early effort of his pen did not, at the time, attract any peculiar attention. The foundation of his fame, as a writer of fiction, was established in 'The Spy; a Tale of Neutral Ground,' which acquired great popularity, being republished in England, and translated into various languages. It has been regarded by

many as one of the best historical tales ever written. The fame of the writer having been thus established, 'The Spy' was soon followed by several other novels of a similar description, which acquired great popularity, and had a very large circulation both in America and Europe; among others, 'The Pioneers,' 'The Last of the Mohicans,' 'The Prairie,' 'The Pathfinder,' and 'The Deer-Slayer.' Of his tales of the ocean, from which his greatest popularity is derived, 'The Pilot' may be said to take precedence. In the same class may be ranked his 'Red Rover,' his 'Water Witch,' 'The Sea Lions,' 'The Two Admirals,' and some others. Our author, however, did not confine the sphere of his literary talents to novel writing. He also distinguished himself as an historian and political writer, and produced, among other works, a complete history of the United States Navy, in two volumes, 'Sketches of Switzerland,' in four volumes, 'Gleanings in Europe,' in six volumes, and a political work, called 'The American Democrat.' On his visit to Europe, in 1827, he was welcomed into the highest circles of the literary world; and formed the acquaintance and friendship of General Lafayette, Sir Walter Scott, and other distinguished characters. In his general politics he professed democratic principles; and in religion he was a zealous Episcopalian. On his return from England he was severely attacked by several American newspapers, who maintained that some of his works showed an aristocratic tendency. He then commenced the system of suing editors of newspapers; and was successful in suits for damages against Colonel Webb, of the *Courier*; Thurlow Weed, of the *Albany Evening Journal*; and the proprietors of the *Tribune*. In these actions he appears to have been materially aided by the favour and respect in which he was held by the courts where the cases were tried; but there is no question of his having been a material loser in a pecuniary point of view. Mr. Cooper appears to have communicated his literary tastes to his family; and one of his daughters is known as the authoress of a very popular work, called 'Rural Hours.' He died at Cooper's town, the place of his ancestors, in 1851.

COPLESTON, Right Rev. Dr. EDWARD, Bishop of Llandaff, Dean of St. Paul's, and Professor of Ancient History to the Royal Academy. He was born in 1776, at Offwell, in Devonshire, of which parish his father was incumbent, and under his roof he received the whole of his early education. In 1791, when he was scarcely fifteen years of age, he was elected to a scholarship of Corpus Christi College, Oxford; and in 1793 he obtained the Chancellor's prize for a Latin poem, the subject of which was 'Marius sitting amid the Ruins of Carthage.' At Easter, 1795, he was elected fellow of Oriel; and in 1796 he obtained the Chancellor's prize for the English essay on Agriculture. In 1797 he was appointed college tutor; the duties of which he performed for many years, to the satisfaction of all. In 1802 he was elected Professor of Poetry, and in 1813 appeared his thirty-five 'Prelections,' written in the purest Latin, and exhibiting a correct and highly-cultivated taste. In 1814 he was elected Provost of Oriel by the unanimous voice of his brother fellows; and early the next term the degree of Doctor of Divinity was conferred upon him by diploma. It was during the term he filled the office of Provost, that he produced his celebrated work on 'Predestination,' in which, as one of his biographers has observed, 'all the distinguished qualities of his mind are united in attempting to demonstrate the folly as well as the immoral tendency of a system which paralyses all human exertion by depriving us of every incentive of hope or fear.'

In 1826 Dr. Copleston was appointed to the deanery of Chester; and in December, 1827, he succeeded Dr. Charles Sumner in the bishopric of Llandaff, and deanery of St. Paul's,—an advancement to which, from his learning and character, he had the highest claims. He there continued to the last to fulfil all the duties of his high station to the satisfaction of all. During that period he was a very extensive contributor to the pages of the *Quarterly Review*; and the Sermons, Charges, &c., published under his name, are very numerous. Nor was he altogether negligent of the Muses, whose favour he had courted in his early manhood; for in 1832 he brought out a pleasing little poem, of much local interest, entitled 'The Churchyard Yew.' He died, at Hardwick House, near Chepstow, in 1849.

COPPER BUSTS AND STATUES. The processes by which these articles are now produced are ingenious, and remarkably curious. They consist of thin sheets of copper,—the whole of the metal having been reduced or precipitated from a liquid solution. We find that sculptors and architects are now gradually availing themselves of this art, in the furtherance of their professional labours. The bust is first modelled in some kind of clay, which may afterwards easily be broken away piecemeal; and on this a thick copper film is deposited by the electro process. The clay core, or model being broken away, the copper remains as a hollow shell, the inside of which has taken the exact impress (though reversed) of the outside of the bust. This copper shell, on being properly prepared on the inner surface, is made the groundwork on which a second deposition takes place; it is used in fact as a mould, from which one or more busts may be procured. The late Bavarian sculptor, Stighmayer, who was employed by King Ludwig, on so many important works at Munich, devised a mode of coating colossal plaster statues with copper, by the electro process, in a remarkably expeditious way.

COPPER MINES (iv. 916-17). No part of Europe affords richer copper than Cornwall. It is there discovered in a vast variety of ores, the most common of which is of a yellow brass colour; but there are also red, grey, black, blue, and green. The grey contains more metal than the yellow, and the red more than the grey. There are, besides, in most of the mines, considerable quantities of malleable copper, which, from its purity, the miners term virgin ore. This is combined with various substances; sometimes with base crystal; sometimes with a

gravelly clay, and sometimes with the crust of iron. Its figure also is much varied; being sometimes in thin plates, shaped like leaves, sometimes in drops and lumps; at other times branched, fringed, or twisted into wires; sometimes crossed at the top like a dagger, and sometimes resembling hollow filigree. It has also been found in powder little inferior in lustre to that of gold, in solid masses of several pounds weight, maturated, unmixed, and highly polished, and in a congeries of combined granules. The water in which the ore is washed has been discovered to make blue vitriol of the best kind; and that which comes from the bottom of the mines is so strongly impregnated with copper, that, were it detained in proper receptacles, it would produce great quantities of malleable copper, without any hazard or attendance, and with little more charge than the purchase of a much less quantity of the most useless old iron; which, being immersed in this water, will, in about fourteen days, produce more than its weight of what is called copper mud, whence a great proportion of pure copper may be obtained. The veins of the copper mines vary considerably in width,—those of Cornwall being generally from one inch wide to upwards of fifty feet. They likewise vary in their direction, and are of unknown depths; for scarcely ever have they been exhausted downwards. Their metalliferous contents (according to geological observations) vary in the same veins, and at different distances from the surface. This may be attributable to the passage of the veins through different rocks; for in many of the mines of Cornwall copper is frequently found following zinc; while mines in the South of France are found conducting first to iron, afterwards to silver, and lastly to copper. (Smith's *Wonders of Nature*).

COPPER TRADE AND SMELTING (iv. 920). The copper trade justly ranks among the most important interests of the country; and its prosperity has been annually progressive. But there are many peculiarities about it deserving of especial notice. It appears that nearly all the copper ore that is raised in England, or brought there, is smelted in Wales; yet in that country there is scarcely a particle of copper ore to be found. Commercial reasons (says the author of 'Novelties, Inventions,' &c.) alone have determined the singular location. South Wales can send coal for the steam-engines of Cornwall, and Cornwall can send back copper ore to be smelted in South Wales. The Swansea district now smelts something near 200,000 tons of copper ore yearly, from which about 20,000 tons of pure copper, worth a million and half sterling, are produced. About ten or a dozen great firms possess the whole of this trade. The smelters are not employed by the mine owners to smelt the ore; they purchase it on speculation, smelt it, and then find a market for the metallic copper. The sellers and the buyers form a sort of family party, which meets once a fortnight at Swansea. The sale is not by auction, but by tender for each lot or ticketing; and experience has enabled the smelters to approach wonderfully close in their tenders for each particular lot. One of the great firms has been known to spend nearly half a million sterling, in one year, for copper ore, besides the machinery and the wages necessary to carry on the smelting. The smelting itself comprises sortings and siftings, calcinings, and meltings, roastings and oxidisings, and other processes, by which all the sulphur and other substances are driven away, and the pure metallic copper alone is left.

COPROLITES (Gr. *κόπρος* and *λίθος*, manure stones) are petrified or silicified bones or fæces of fishes, reptiles, or other animals of antediluvian epochs. They occur abundantly in certain geological formations, such as the lead and coal strata; the former containing those of the ichthyosauri, or fish lizards, of that period; and the latter, the sauroid fishes. They are found in blackish-green or brown lumps of considerable hardness, and contain from 50 to 60 per cent. of phosphate of lime, or bone-earth, which is nearly as much as the bones of our domestic animals. They are often found in the upper green sand of the south and south-west of England, which extends between two and three hundred miles in length. On the sea-coast these coprolites are often washed out of their primitive embedments, and collected in ship-loads for manuring purposes. It often happens that these minerals, when near the surface, often render the soil very prolific; and instead of being applied, on account of their hardness, to the mending of roads, as formerly, they are now made available for manuring the soil, on account of the quantity of phosphoric acid and animal matter they contain. The operation of dissolving them is similar to the process adopted in the decomposition of bones. After grinding them between granite mill-stones, the powder is dissolved in vitriol, or sulphuric acid. By mixing the material with stable manure, a compound may be obtained, possessing the properties of the best guano, especially if a little salts of ammonia be added. Some extensive formations of these coprolites have been lately discovered in America; and the produce has been so abundant as to warrant the expectation of their forming an article of commerce as valuable as the guano of the South Pacific coast.

During the summer of 1854, an immense quantity of coprolites was discovered in East Suffolk, on the shore extending from Bawdsey, through the parishes verging towards Woodbridge. The mineral is found to be most valuable for manuring and other purposes; and hundreds of tons have been shipped to different ports. The extraordinary veins which have been discovered, open a field for the geologist and the man of science far more interesting than in any other part of the kingdom. Among these fossils of the antediluvian world, are relics of an enormous species of fish, animals, and shells, most of which are now extinct. They are chiefly found near springs of crystal water, surrounded by craig. Some of the ridges are dug twenty feet deep, while others are within two or three feet of the surface. These excavations give employment to a vast number of people, who are daily at work in some of the coprolite districts.

(Stockhardt's *Agricultural Chemistry; Journal of Agriculture*, &c.)

COPYRIGHT (iv. 928–33). In the Act 5 and 6 Victoria, for determining the law of copyright, there is no distinctive definition of what constitutes that right. In this respect the Act is singularly defective. The penalties for reprinting or pirating the work of another are defined with sufficient clearness; but the use which may be made of the facts or materials of preceding writers appears to be vague and uncertain; and the decisions of the law-courts are not always uniform. In the celebrated case of Donaldson *v.* Becket, it was decided that there was no copyright at common law. Therefore we must rely either on statute law or judicial decisions; and to arrive at anything like a settled opinion we must have recourse to the writings of our most eminent lawyers, or to the judicial authorities of our equity and common-law courts, upon which their opinions have been founded.

Judge Blackstone, in his article on copyright, gives the following admirable definition:—'The identity of a literary composition consists entirely in the sentiment and language.' Blackstone says nothing about copyright in facts or general subjects,—the sentiment and language alone being the identifying features of literary property. In Vesey's 'Reports' (Wilkins *v.* Aikin), we find it decided that 'copyright exists in an individual work, but not in a general subject, though from its nature the consequences may be a close resemblance and a considerable interference.' It has also been decided (as in the case of Bell *v.* Walker) 'that an injunction cannot lie against a fair abridgment, because the judgment of the author is shown.' In the case of Carey *v.* Kearsley (K. B. 1802), an action was brought for the piracy of Patterson's 'Book of Roads;' and it was proved that the defendant had made large extracts from the plaintiff's work, and published them in his own book, with additions and observations; but it did not appear that any entire paragraph had been copied. Lord Ellenborough decided that 'the mere publication of passages from another work was not sufficient to constitute a piracy. It was lawful to incorporate part of the work of a contemporary writer in a new work, provided it was not a pretext for stealing the original copyright.' The plaintiff was therefore nonsuited. But subsequently, in the case of Carey *v.* Longman (tried before Lord Kenyon), for an infringement of copyright in the same work, a verdict was given in favour of the plaintiff, because it was proved that the defendant had copied verbatim about nine-tenths of the plaintiff's improvements, and that many of the alterations were merely colourable.

From the above cases we perceive that passages may be freely taken from another's work, but not entire paragraphs. Godson, in his 'Law of Copyright,' p. 334, thus clearly defines the rights of each party:—'When two parties exert their talents on the same subject, they may produce works of great dissimilarity; but each of them will be entitled to full power over his own books; and any priority of publication will not affect the property in the one last published. Taking the same general subject they may differently arrange what is said upon it,—add new parts, or omit useless ones; and each of them will respectively acquire a copyright in his production. There must not, however, be any copying from the former work. The subject is open to all; but copyright exists only in the result of each man's labour.' In another place the same authority observes, that if the main design of a work be not copied, the circumstance that a part of the composition of one author is found in another is not of itself sufficient to support an action. 'A man may fairly adopt a part of the work of another, for the promotion of science and the benefit of the public. It is not sufficient to constitute a piracy, that parts of one author's books are found in that of another; unless it be nearly the whole, or so much as will show that it was done with a piratical intent.

Petersdorff, in his 'Abridgment of the Law,' goes still farther, and says that 'cases may occur, in which a writer may use the whole of the work of a former author who has availed himself of the same sources of information, without being rendered liable to an action; such as chronologies,' &c.

In a recent case (Bogue *v.* Routledge), in which the plaintiff applied for an injunction on a work entitled 'Every Boy's Book,' because, as alleged, it was an infringement of copyright on 'The Boy's Own Book,' it was decided, by Vice-Chancellor Stewart, that there was no infringement,—first, because the plaintiff had failed to show the originality of his own work; and secondly, because the defendant had not adopted 'the language and sentiments' (as Blackstone says) of the plaintiff's book; although he had produced a close imitation of its title and general plan, and published various articles on similar subjects.

Thus, from various judicial decisions, and from many of our leading authorities who have adjudicated or written on the laws of copyright, we arrive at the great moral and legal truth, that 'all human events being equally open to the observation of all men, every one is at liberty to add or improve the materials already collected.'

COPYRIGHT, INTERNATIONAL, is the right of authors to republish their works in a foreign State, and there receive protection from literary piracy, in the same way as in their own country. Many efforts have been made by our countrymen to accomplish this desirable object; and in some instances they have been successful. In 1851 an international copyright was agreed upon between England and France, which extended to authors of the respective countries the same rights of exclusive publication in each country, as they were specially entitled to in their own. By this treaty an author of either State may reserve to himself the right of publishing a translation of his work into the language of the other, on condition that such translation is begun to be published within twelve months of the time of the publication of the original work. At the same time each country binds itself to prohibit the sale, within its dominions, of piratical editions of literary or artistic works of the other country. The treaty also extends to the representation of dra-

matic works, and the performance of musical compositions.

In 1854 a convention was entered into between this country and the Free Hanseatic City of Hamburgh, for the establishment of international copyright. By this convention it is provided that the authors of works of literature or of art shall be so protected, that the republication or piracy in either State shall be dealt with in the same manner as the republication or piracy of a work first published in such other State. The protection was extended to dramatic works, musical compositions, painting, sculpture, engraving, and lithography. The duties on works published in Hamburgh, and imported into this country, were reduced. Protection is also given to translations; and piratical works may be seized or destroyed. By an order in Council, Her Majesty directed, that in lieu of the duties of Customs hitherto payable, the following duties should be paid:—Works republished in Hamburgh, 2*l.* 10*s.* per cwt.; if not originally produced in the United Kingdom, 15*s.* per cwt.; single prints, ½*d.*; bound or sewn, 1½*d.* the dozen.—By another order in Council, an international copyright was also established with the State of Hanover.

Various attempts have also been made to establish an international copyright law between this country and the United States of America, but hitherto without effect.

COR'ACLE, the name of a small boat, used by the Egyptians, Persians, and other ancient nations. These boats were oval-shaped, and composed of willow-twigs, covered externally with the hides of animals. They were also in use among the Celtic nations, and among the ancient Irish.

CORAL, and CORAL ISLANDS (iv. 935). These zoophytes, or animal plants, may be classed amongst the minutest wonders of creation; and it is only within a few years that their natural history has been fully developed. *Coral* may be described as a calcareous marine production secreted by polypi; and the *Corallaria* is a family of the Corticiferous Polyparia, in which the animals are hydroform, with internal ovaria. They are formed externally of a living gelatinous cretaceous substance, and internally of a solid horny, or calcareous axis, concentrically laminated, with a large base, by which they are attached to foreign substances.

The *Corallina*, or *Corallines*, are a genus of the Pseudozoaria, in which the stem and branches are flabelliform.

A Coralline, in short, may be defined as a zoophyte, in which each polypus is contained in a calcareous or horny shell without any central axis. The term is also applied to the animal which secretes the coral.

These little zoophytic creatures, in the course, perhaps, of numberless ages, build up their rocky structures from the depths of the ocean to the surface of the water; and it is probable that their works are eternally going on, and new islands constantly emerging from the bosom of the ocean. M. de Peysonnel, of Marseilles, was the first to discover, in the middle of the last century, that the little bodies, which had been taken for flowers, were insects inhabiting the coral. He also perceived that, when the coral was first taken out of the sea, the protuberances on the surface were soft, and yielded a milky juice, which was the blood of the animal. This fluid running along the substance or body of coral changes its nature, and becomes a calcareous stone, or coral rock.

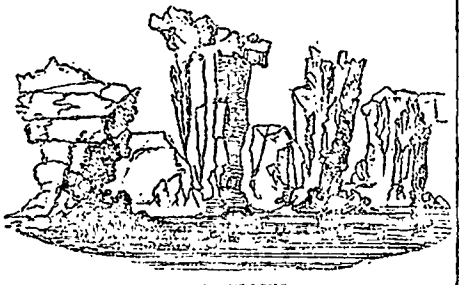
The formation of coral (says the editor of the 'Gallery of Nature') is one of those chemical processes in the great laboratory of nature, which the skill of man has not enabled him either to imitate or to comprehend; but the fact is clear, that huge masses of solid rock are formed by these diminutive living agents,—sea-workers toiling and spinning to the music of the waves, whose constructions are capable of resisting the tremendous power of the ocean, when most agitated by winds and tempests, and ultimately become a secure habitation for man himself. The coral substance appears to bear the same relation to the insect as the shell of a snail or an oyster does to either of those animals, without which they cannot long exist; and it is upon the death of the animalcules, that their separate structures become firmly knit together by some mysterious cement, and serve as a basis for the erection of fresh races, which, as they die off, increase the growth of the firm and solid fabric.

The coral rocks, as they emerge from the surface of the sea, in process of time, probably by the agency of birds, become covered with vegetable soil, and soon begin to produce the different varieties of the vegetable kingdom. The base of the island is nothing more than a coral bank; while the surface is a black soil, formed of a

mixture of sand and decayed vegetable matter. The island thus formed is usually flat, long, and narrow, and extends lengthways from north to south, because nearly all the winds between the tropics blow either from the east or the west. The sides of these islands frequently constitute a perpendicular wall; and the sea, at a little distance from them, is of unfathomable depth. The islands in the South Sea are mostly coral rocks covered over with a superstratum of soil.

According to Captain Cook, there are, in the Southern Ocean, perpendicular coralline rocks, which are of such magnitude as to render the navigation of those seas extremely dangerous.

Captain Wilkes describes one of the coral islands, visited by the American expedition to the South Seas, which is represented as having three distinct stages of shelving coast; the one level and broad, and entirely uncovered at low water. The annexed sketch shows the outline of some of the coral blocks examined on the Paumotu group; some of them being from 15 to 20 feet high.



CORAL BLOCKS.

Captain Wilkes also describes a remarkable island of coral formation, situated in lat. 15° 49′ S. long. 148° 13′ W., commonly known as Aurora Island. On its eastern side our narrator sounded 150 fathoms, from its perpendicular cliff, without finding any bottom. The cliff, when measured, was found to be 250 feet in height. The coral shelving of the island was 550 feet wide, gradually diminishing in width, until it lost itself in the sea. Captain Wilkes then proceeds to describe the coral formation of this remarkable island. 'The upper portion,' says he, 'is composed of limestone, or compact coral rocks. The cliff, on its eastern side, when we landed, appeared stratified, horizontally, in beds of ten to twelve feet thick, of a sort of conglomerate, composed of shells, coral, and pieces of compact rock, cemented together by a calcareous deposit. The under part of this bed had been much worn by the sea. The rich soil was composed of decayed vegetable matter and decomposed lime-stone; and the slabs that were lying loose on the surface had a clinky metallic sound when struck. The island has unequivocal marks of having been uplifted at different periods; the cliff, at two different heights, appearing to have suffered abrasion by the sea.'

Another coral formation, of some interest, called Dean's Island, was surveyed, which appeared like a reef washed by the sea. The rocks of coral appeared in great numbers, and showed themselves very conspicuously, of which the annexed sketch will convey a tolerably correct idea.

CORAL ROCKS.

Although coral insects exist in tolerable abundance in different parts of the Mediterranean, it is in the great Pacific that these diminutive creatures are effecting those mighty changes, in comparison with which the labours of man are insignificant. Various navigators have furnished us with many curious and interesting details. In the seas around Loo Choo, where the zoophytes belonging to the genera Astrea are the most common, the attention of the celebrated voyager, Captain Basil Hall, was attracted to their wonderful operations. He entered into an examination of one of the coral reefs; and the account he has given is of sufficient interest to quote at some length:—'When the sea has left it for some time, it becomes dry, and appears to be a compact rock, exceedingly hard and rugged; but no sooner does the tide rise again, and the waves begin to wash over it, than millions of coral worms protrude themselves from holes on the surface which were before quite invisible. These animals are of a great variety of shapes and sizes, and in such prodigious numbers, that in a short time the whole surface of the rock appears to be alive, and in motion. The most common of the worms in Loo Choo was in the form of a star, with arms from four to six inches long, which it moved about with a rapid motion in all directions, probably in search of food. Others were so sluggish, that they were often mistaken for pieces of the rock: these were generally of a dark colour, and from four to five inches long, and two or three round. When the rock was broken from a spot near the level of high water, it was found to be a hard solid stone; but if any part of it were detached at a level to which the tide reached every day, it was discovered to be full of worms, of all different lengths and colours, some being fine as thread and several feet long, generally of a very bright yellow, and sometimes of a blue colour; while others resembled snails; and some were not unlike lobsters and prawns in shape, but soft, and not above two inches long. The growth of coral ceases, when the worm which creates it is no longer exposed to the washing of the tide. Thus a reef rises in the form of a gigantic cauliflower, till its top has gained the level of the highest tides, above which the worm has no power to carry its operations, and the reef, consequently, no longer extends itself upwards. The surrounding parts, however, advance in succession till they reach the surface, when they also must stop. Thus as the level of the highest tide is the eventual limit to every part of the reef, a horizontal field comes to be formed coincident with that place, and perpendicular on all sides. The reef, however, continually increases, and being prevented from going higher, must extend itself laterally in all directions; and this growth being

probably as rapid at the upper edge as it is lower down, the steepness of the face of the reef is preserved; and it is this circumstance which renders this species of rocks so dangerous in navigation.'

CORBAN, among the ancient Jews, a gift or present made to God, or to his temple. They sometimes swore by the gifts thus offered. Moses speaks of different kinds of corban, or dedication by the Hebrews, of parts of their estates, which, as appears from Levit. xxvii. 29, might be affirmed, redeemed, or sanctified if it were cattle. Josephus informs us, that the corban was peculiar to the Jews, and not practised by the Syrians, or other eastern nations. He also remarks, that men and women sometimes made themselves corban, that is, consecrated themselves to God, or to certain offices in his service. If they were afterwards desirous of cancelling their obligation, they gave to the priests for a man fifty, for a woman thirty shekels. Our Saviour reproaches the Jews with cruelty towards their parents, in making a corban of what should have been appropriated to their use. But the corban was at length carried to such an excess by the Jewish doctors as to become injurious to society. They permitted debtors to defraud their creditors, by consecrating their debt to God, as if the property were their own, and not the right of their creditor. (Calmet.)

CORIU'DO, a genus of reptiles belonging to the family Chelonidæ—the *Testudo midas* of Linnæus, or the common turtle. It is found from six to seven feet long, and weighs from seven to eight cwt.; it is distinguished by its greenish coloured plates, which are thirteen in number. It feeds at the bottom of the ocean on sea-weeds, but approaches the mouth of rivers to respire. Like the crocodile, these reptiles deposit their eggs on the sand, and leave them to the heat of the sun for hatching. Their flesh is a most excellent food.

CORNARDS, in the middle ages, a fraternity of buffoons, who, originally came from Normandy, and on the different holidays played their mummeries in the public streets, wore masks, and personated sovereigns and church dignitaries. Sometimes men of rank entered into the society, and elected an Abbot as their head. (Du Cange.)

CORNAGE, a feudal tenure, held by many persons on the northern borders, near the Picts' Wall. The service of this tenure was to blow a horn, when there was any alarm of invasion by the Scots. This service was afterwards commuted for a payment in money, which the sheriffs accounted for under the title of *cornagium*. (Camden.)

CORNBRASH (iv. 958) in geology, the local name of a thin calcareous deposit, which forms the uppermost band of the Bath Oolite, and is so called from its being useful as manure in the raising of corn crops. Dr. Thomson describes the Cornbrash as a loose rubbly limestone, of a grey or bluish colour, which rises in flakish masses, of about six inches thick. The upper beds of stone which compose this rock, contain fossils naturally different from those in the undermost beds. In Wiltshire it is particularly known by the name of *cornbrash*, or *corngrit*; and at Malmesbury, where it is thick and solid, it is much quarried for building; but in some places it is only fit for burning into lime, and for mending roads. In Oxfordshire, the beds belonging to this stratum are of a chalky or pasty consistence and colour. Here the marine bivalves are found in great abundance. (Dr. Thomson's *Outlines of Mineralogy, &c.*)

CORNCRAIK, in ornithology, the *Crex pratensis*, or Land-rail, of the natural order Gralidæ; a migratory bird, which leaves Great Britain in September, and returns towards the latter end of April. It receives its name from being an inhabitant of cornfields, and from its peculiar evening cry of *creck, creck*. It is seldom seen on the wing. Its nest is of a rude description, being formed of withered grass and a little moss; and its eggs, which are generally very numerous, are of a dull, reddish colour, blotched with brown.

CORNICULA'RIUS, a *cornet* or trooper in the Roman army, who assisted the military tribune in his duties. In giving orders he made use of a little horn (*cornu*), whence the designation was derived. The Cornicularius was also a subordinate officer in the Roman courts of law, whose duty it was to preserve order.

CORNWALL, County of (iv. 965). According to the census of 1851, the population of the entire county was 355,558; of which 171,636 were males, and 183,922 females. Of houses, inhabited and uninhabited, there were 72,531. The population of the principal parishes and towns was as follows:—

Bodmin.....p.	6,337	Liskeard { mun.	4,386
Breage.....	4,543	{ parl.	6,204
Callington	2,146	Lostwithiel ...	1,053
Calstock	4,536	Megavissey ...	2,022
Cambourne	6,547	Padstow	2,224
Crowan.....p.	3,982	Paul	5,408
Falmouth mun.	4,953	Penryn ...mun.	3,959
Falmouth and Penryn.....p.	13,656	Penzance mun.	9,214
Fowey.....p.	1,606	Redruth	7,095
Gwennap	10,465	St. Agnes	6,674
Helston { mun.	3,255	St. Austell	3,565
{ parl.	7,321	St. Germans ...	2,969
Illogan	9,256	St. Ives	9,872
Kea	3,752	St. Just	8,759
Kenwyn	9,743	Truro	10,733
Launceston ...	6,005	Wendron	3,675

COR'ODY, in the middle age, an allowance due from a religious house to the king, when he was the founder thereof. It was paid, either in money or provisions, towards the support of one of the king's servants or favourites, on whom he thought proper to bestow the allowance.

CORUN'DUM (iv. 998) is a species of crystallized alumina, from which several varieties of artificial precious stones have been recently produced, by M. A. Girardin of Paris. Some of his interesting experiments were lately brought under the notice of the Academy of Science, by M. Becquerel, who exhibited, as the results of those experiments, crystals of the white sapphire. It is well known that corundum, the sapphire, and the ruby are crystallized alumina; and that the colours are due to minute quantities of oxide of iron, or chrome. M. Girardin has succeeded in obtaining those aluminous crystals by placing in a

crucible some ammoniacal or potash alum, previously calcined, mixed with an equal quantity of sulphate of potash, the whole being covered with lamp black; the crucible was then submitted, for a quarter of an hour, to the most powerful action of a forge fire. By the action of the carbon upon the mixture, at this high temperature, there are formed sulphide of potassium and crystallized alumina, and by the admixture of a little iron or chrome, the ruby or the coloured sapphire can be produced. M. Guidraux, a lapidary, who was employed to pierce one of the crystals thus obtained, assured M. Becquerel that it was considerably harder than the ordinary rubies which are employed for pivots.

CORYBAN'TES, priests of the goddess Cybele, frequently mentioned by the poets of classical antiquity. They were famous for tossing their heads, dancing up and down, and assuming the attitude and antics of maniacs.

CORYPHÆ'US, in Greek tragedy, the leader of the chorus, who took part in the action as one of the persons of the drama. Hence the name has been applied to signify the chief of any company whatever.

COTA'RIUS, in the feudal ages, a sort of tenant, who paid a stated rent in provisions or money, and thus held free socage tenure; whereas the *Coterellus* appears to have held in mere villenage, and in a state of complete serfdom. They are both mentioned in Domesday.

COTHUR'NUS, the name of the buskin used by ancient tragedians; of which there are many representations in ancient monuments. The heroes always made their appearance on the stage in large cothurni.

COT'SETHUS, in the feudal ages, the lowest description of bondsman, who held by servile tenure, and was bound to work exclusively for the feudal lord. The term *Cotter* is a cognate word with Cot'sethus.

COTTON MANUFACTURES AND TRADE (v. 5–10). During the last few years the cotton manufactures of this country have been making rapid and most amazing strides. In Calicut, in India, from which Calico was first brought, and where it is grown, it is still woven by the Hindoo weaver, by means of a little primitive loom in the open air, at a handful of rice a day. From those localities cotton is still brought, for the supply of Lancashire; and the difference of manufacturing means may be thus illustrated:—With the aid of a steam engine of 500-horse power, (that is, steam power equal to 5,000 men continually working,) 150,000 spindles are kept going, and 879,110 yards, or 499 miles of thread are delivered per minute—or, in half an hour, an extent of thread which would reach beyond the place in India from whence the material was brought, or, in the working day of ten hours, an extent of thread that, from this one spinning mill, would wrap twelve times round the world; while the poor Hindoo spinner can only spin a mile of thread for about fourpence. In spinning fine yarn a single workman, on a self-acting mule, can now do the work of 3,000 hand spinners with a distaff and spindle; and in the manufacture of lace one man with a machine can do the work of 8,000 lace-makers on the old principle. Hence, from these amazing powers of mechanical production, the great cotton manufacturers of this country continue to exhibit the most gratifying signs of prosperity. In an elaborate report, prepared by the House of Commons in 1851, we find some valuable statistical estimates of the amazing extent of the cotton trade and manufactures. It is there stated, that we work up into yarn nearly two million pounds of cotton every day; that we have twenty million spindles, whirling their rapid course in spinning this cotton into yarn; that a quarter of a million power looms, besides hand looms, are employed in weaving so much of this yarn as is not exported before weaving; that we have two thousand factories in which this mass of cotton is spun and woven; that between three and four hundred thousand persons are daily employed within the walls of these mills, besides those elsewhere engaged in various kinds of manufacture; that the machinery of these mills requires eighty thousand horse power of steam and hydraulic agency; that, after supplying the home demand in 1850, we exported woven cotton goods to such an extent as would give an average of nearly four million yards (far beyond two thousand miles) *every day;* that, besides cotton lace and hosiery, we exported nearly half a million pounds of unwoven cotton yarn per day. Hence arises the great secret of our material wealth during the expenses of war; our productive powers, in fact, being greater than the consumption required. Thus, during the late war with Russia, when the armies of five European nations were engaged in dire conflict, the never-tiring looms and ceaseless spindles of Manchester worked on with accelerated speed, and sent abroad twenty millions of cotton goods more than in the previous year; and with peace, the speed was still further accelerated. During the eleven months of 1856, compared with the same period of 1854, an increase of sixty million yards was exhibited; or, estimated by amount in money, of fifteen per cent. more than that of 1854, and ten per cent. above the year 1855. The quantity of raw cotton imported, to answer this demand, increased from seven to eight millions of cwts.

COTYT'TIA, nocturnal festivals celebrated in different parts of Greece, in honour of Cotytto, the goddess of lewdness. They were of the most infamous description, and have been reprobated by Juvenal.

COUNTY COURTS, local tribunals for the recovery of debts under 50*l.* They were first established, by Act of Parliament in 1846 (9 & 10 Vict.), for the recovery of all debts under 20*l.*; but their jurisdiction was afterwards extended to debts of 50*l.*, on condition that the plaintiff and defendant agreed to the suit being carried on and decided in the local court. The jurisdiction of these Courts, according to the provisions of the Act 9 and 10 Vict., extended not only to actions of debt, but to all cases of assault or injury to the person or goods, in which the damages did not exceed 20*l.* All matters in dispute between masters and servants, or masters and workmen, under 20*l.*, may, by the same statute, be tried and disposed

of in less than fourteen days. A debt of 20*l.* may thus be decided for less than 2*l.*, which the defendant has to pay with the debt; and smaller amounts at a proportionately less expense, if the parties attend in person. There is also a provision in the Act for obtaining possession of houses and land, when the rent does not exceed 50*l.* per annum. The presiding Judge of the Court is a Chief Commissioner, who is a member of the bar, especially appointed by the Crown. His business is to decide all cases brought before him, agreeably to the principles of equity and law, and the usual rules of evidence. He is assisted by a chief clerk, or registrar, and other subordinate functionaries. But solicitors and gentlemen of the bar are allowed to plead on certain conditions; and their fees are limited by the rules of the Court. The parties to the suit have the power of also having their cases decided by a jury, instead of the Commissioner, on certain conditions. By the provisions of the Act, the Palace Court at Westminster was exempted from the operation of the measure; but as actions in that Court were found to increase and militate against the success of the new measure, in the Metropolitan districts, an Act was passed, 12 and 13 Vict., which entirely abolished the Palace Court, the Court of Marshalsea, and the Court for the Honour of Peverill; and no new suits have been allowed in them since August 1849.

During the ten years that these Courts had been in operation, they were found very effective in settling the numberless disputes for the recovery of petty debts, which would otherwise have been carried, at an enormous expense, through the superior Courts of Record. Faults and defects, however, were found in practice to exist; and in 1856 the original Act underwent various alterations and amendments, by which its jurisdiction and powers were materially extended. This amended Act came into operation on the 1st of October of the same year; and according to its provisions, all actions, except for crim. con., may be tried in the County Courts, even on questions of title, by mutual consent; and without consent, when the amount at issue is reduced by set-off under 50*l.* Summonses may be issued against persons out of the jurisdiction of the Court, if the cause of action arose within it. The Metropolitan districts are to be deemed as one district, and summonses may be issued, either in the plaintiff's district, or the defendant's. The County Court Judge is empowered to order a trial in another district. The superior Courts may also order trials in the County Court; and a certiorari may be issued to remove a plaint on the order of a judge of the superior Courts, on giving security for the amount of the claim and the costs, not in the whole exceeding 100*l.* When the sum sued for is above 20*l.* on contract, or above 5*l.* in tort, the defendant may object to the trial in the County Court; and on giving security the proceedings in the County Court will be stayed. There are several clauses of considerable importance to landlords, which extend to the recovery of premises in a summary way, when the value does not exceed 50*l.* per annum, which will prevent actions of ejectments in the superior Courts. When the term has expired in property, where neither the value of the premises nor the rent is more than 50*l.* by the year, a plaint may be entered, and in default of the tenant giving up the same, the bailiff may enter and give the landlord possession. In plaints for the recovery of possession, the plaintiff may recover his rent where the same does not exceed 50*l.* Further, the Act provides that where there is a half-year's rent due, and the landlord has a right to re-enter, possession may be given by the County Courts.

The principal alterations and amendments, in the practice or proceedings of the County Courts, are as follow:—If the sum in dispute be above 20*l.*, the defendant may be required to give notice of his defence; otherwise there will be judgment by default. Where the judgment does not exceed 20*l.*, the Court may order the amount to be paid by instalments. Above that sum, the plaintiff's consent is requisite. Priority of execution is to depend on the time of applying to the registrar for a warrant; and when issued from a superior court, from the delivery of the writ to the sheriff. The fees on proceedings are specified in the schedule to the Act, subject to be increased or diminished by the Lords of the Treasury, with the Lord Chancellor's consent. The proceedings for obtaining possession of small tenements are regulated by sections 5 to 56 of the Act; and actions of replevin are regulated by sections 63 to 68. Where claims are made in respect of goods taken in execution, the claimant must deposit the value in court to abide the decision of the judge; and where goods are seized under the process of the court, the landlord is entitled to rent in arrear, regulated by the nature of the tenure, s. 75. A suitor may have his case tried by jury, if he prefers it, at an extra cost of 5*s.* instead of 2*l.*, as heretofore.

The acknowledgment of deeds by married women, under the 3 & 4 Wm. IV., cap. 74, may be made before a judge of the County Court.

The 'registrar' (formerly called the 'clerk') of the court is now limited to a single court, and is entitled to compensation for the loss he may sustain. A proviso, however, is made in favour of the clerks of the courts.

COURT LANDS, or CURTILES TERRÆ, among our Saxon ancestors, the lands appropriate to the court, or house of the lord. The thanes or nobles, who possessed hereditary lands, divided them into inland and outland. The inland or court land, was that which lay adjacent to the mansion-house, and was, therefore, kept apart in the hands of the lord, for the support or recreation of himself and family, and consisting of gardens, parks, pasture lands, &c. The same lands, in the Norman period, were called *demesne* lands (*terras dominicales*).

COURTS OF ARBITRATION. The frequent disputes arising between employers and their workmen, in many of our large manufacturing establishments, have long shown the necessity of establishing Courts of Arbitration, or of Conciliation, to which trade disputes of all kinds might be referred, instead of having recourse to 'strikes,' or to those violent modes of settlement.

too often attempted both by masters and workmen. To some extent a system of arbitration or reference has long been prevalent in certain localities, especially among the cotton-spinners, carpet weavers, engineers, and various other trades; and this has been found to work advantageously for all parties, so long as each of the litigants was willing to abide by the decision of the arbitration, but unfortunately when one of the parties resisted the adjudication there was no effective law to enforce it. Hence the necessity of parliamentary sanction and constitutional authority. Some time ago, the printers of London attempted to establish a certain tribunal for the settlement of disputes, the decision of which was to be based, as far as possible, on the established custom of the trade. But a case arose, where the three masters voted one way, and the men the other. The barrister, who had been appointed to preside over the board had the right of giving the casting vote, and he gave it against the men, since which the court has fallen into disrepute, and its decisions have been disregarded.

The increase of these voluntary associations being considered as a cheering symptom of social progress, the attention of the legislature has been very properly directed to the necessity of rendering Courts of Arbitration a permanent feature in the institutions of the country. In February, 1856, the House of Commons agreed to the appointment of a select committee 'to inquire into the expediency of establishing Equitable Tribunals for the amicable adjustment of differences between masters and operatives.' In reporting on the result of their inquiries, the committee showed that there was already an Arbitration Act in existence, which was passed in the reign of Geo. IV. According to this Act disputes between masters and men might be settled summarily by a justice of the peace, or by arbitrators appointed by such justice. The award was to be regarded as final and conclusive, and powers, given by the 13th clause, to enforce it. The statute, however, appears to have been inoperative; for which the following reasons are assigned by the committee: they say that 'there exists an unwillingness to go before a magistrate, as bearing some appearance of a criminal proceeding; that the arbitrators being appointed as each case arises, it is not known beforehand who they will be, and there is a reluctance to refer the dispute to the decision of an unknown set of men; and that the workmen object to the selection of arbitrators from among the magistrates in manufacturing districts, on the ground that, being generally manufacturers, or in some way connected with manufacturers, such arbitrators are likely to entertain a fellow feeling towards their own class, and a bias against the workmen.' The committee came to the conclusion that the formation of permanent courts of conciliation in this country, more particularly in the large commercial and manufacturing and mining districts, would be beneficial, and that the measure might be introduced as an amendment in the present Arbitration Act, according to which both masters and workmen might be enabled, each for their own class or calling, to appoint referees, an equal number by each party, having the power to elect a chairman unconnected with either side, who should have the casting vote. The committee suggested, however, that these tribunals should have no power in regard to the formation of contracts, or in any way regulating compulsorily the rate of wages.

If we may judge by the practical working of local courts in this country, and the acknowledged utility of arbitration courts on the Continent, there is no question but that such a measure as that recommended by the parliamentary committee of 1856, would be very beneficial to the industrial classes. The arbitration courts in France and Belgium (called *Conseils de Prud'Hommes*), established by Napoleon in 1806, are similar in principle and operation to the trade tribunals now sought to be established in this country, and may serve as a precedent. The custom there is for the government to establish one of these courts at the recommendation of the Chamber of Commerce in any particular town or trade. The president and vice-president are appointed by government, and the members comprise at least three masters and three workmen. Each conseil holds a *bureau général*, or general court, once a week, at which at least four members must be present, besides the president and vice-president. A sub-committee, or *bureau particulier*, of two members, sits in most towns, every day. It is found by the experience of many *conseils* during a long period that, out of every sixteen questions or disputes, fifteen are settled by the petty or daily court, leaving only about one in sixteen to be referred to the weekly court or *bureau général*. In Denmark, Norway, and other continental States, courts are established for similar purposes, and some of these courts are not restricted to trade disputes, but have authority in all civil causes where large sums of money or extensive interests are not at stake.

COURTS OF JUSTICE (v. 41). With all the great nations of antiquity, the due administration of the laws formed a most important characteristic; for no sooner does man emerge from a state of savage life, than he discovers the necessity of submitting to certain rules and regulations for the guidance of the virtuous, or the control of the wicked; and thence laws and courts of justice become established. Among the early Egyptians, a code of laws, over which thirty judges were appointed, existed almost from the time of Menes. Among the Cretans, the courts of justice, established by Minos, have been the admiration of all ages, and served as a model for various nations: The Carthaginians derived their code of laws, and the methods of administering them, from the Phœnicians. The principal tribunal, or court of justice, consisted of 104 persons, usually called, for brevity's sake, the Tribunal of the Hundred. The ancient Hebrews had two kinds of courts—the *Sanhedrim*, or great Consistory, and the *Council*, or lesser court. The Sanhedrim consisted of seventy-one elders or Judges, and was the supreme court among the Jews. In Athens there were ten different courts of justice, besides the Areopagus, each of which consisted of several hundred

judges, who were changed every year. Four of these courts were appropriated to criminal matters, and six to civil. Among the Romans, all criminal matters took place before the assemblies of the people, called *comitia centuriata*, and *comitia tributa*; the former taking cognizance of such questions as affected the life or liberty of a Roman citizen; and the latter of offences of a minor character. The ordinary magistrates of Rome, who had to superintend the administration of the laws, were the *magistratus majores*, consisting of the consuls, prætors, and censors, and the *magistratus minores*, as the tribunes, ædiles, and questors. The extraordinary ones, who at times were vested with a sort of universal jurisdiction or absolute authority, were the dictator, the consul, or the prefect.

From the ruins of Roman Jurisprudence, innumerable courts of justice have arisen, and been established in Europe under different names. In Great Britain we have the High Courts of Parliament, and of Chancery; the Courts of Queen's Bench, of Common Pleas, and of Exchequer; Courts of Assize, Courts of Admiralty, Courts Martial, Courts Baron, Hundred Courts, Courts Leet, Sheriff's Courts, County Courts, and numerous others of minor or local importance, which are all noticed under their respective heads.

COWLEY, RIGHT HON. HENRY WELLESLEY, LORD, a distinguished diplomatist, and British ambassador at the courts of Madrid, Vienna, and Paris. His lordship was the sixth son of Garrett first Earl of Mornington, and youngest brother of the Duke of Wellington. He was born in 1773; and at the age of twenty-two was appointed a précis-writer in the Foreign Office. Two years afterwards he entered on his career of diplomacy, and accompanied the embassy of Lord Malmesbury to Lisle. In 1797, on the appointment of his brother, Lord Wellesley, to the government of India, he became his private secretary—an office which opened a wide field for his diplomatic talents; for he had not been much more than a year in India, when he was selected as one of the commissioners in Mysore,—the duties of which he discharged with so much satisfaction, that the East India Company presented him with 4000*l*. He was afterwards appointed lieutenant-governor of the ceded districts of the Nawab of Oude. After completing the settlement of Oude, Mr. Wellesley, in 1803, returned to Calcutta, and soon afterwards revisited Europe to pursue his fortunes in his native country. In 1807 he was returned to parliament as member for Eye; and became secretary of the Treasury; but in 1809 he was appointed ambassador at Madrid; which situation he ably filled, amidst great difficulties and obstructions, for thirteen years. His diplomatic talents and statesman-like qualities were now fully appreciated; and in 1823 he was sent as ambassador to Vienna, where he remained till 1831. For the ability he there displayed, and the important diplomatic services he had rendered to his country generally, he was raised to the peerage, with the title of Baron Cowley, which was the original patronymic of the Wellesley family. On the accession of the Peel ministry, in 1841, his lordship was appointed British ambassador at the court of the Tuileries, which office he continued to hold, with great satisfaction to all parties, until the fall of Sir R. Peel's ministry in 1846. His lordship, however, had been so accustomed to living on the Continent, that after a short residence in England he returned to Paris, where he died in 1847.

COW-TREE, a South-American species of the genus *Brosimum*, or *Palo de Vaca*, as it is called by the natives. It is described by Humboldt under the name of *Galactodendron*, or Milk-tree, on account of its yielding, from incisions cut in the bark of the trunk, a liquid similar to the first milk given by the cow after calving, which, on analysis, is found to contain 30·57 per cent. of galactin. There is also a species of Cow-tree in equatorial South America, known by the name of Hya-Hya, or *Tabernæmontana utilis*, which pours forth a stream of thick sweet milk, from incisions made in the bark, and belongs to the natural order *Apocynaceæ*, or Dogbanes.

CRABB, GEORGE, the lexicographer, was born at Palgrave, in Suffolk, in 1778. He received his education at Diss; and his mind became early bent on study and general learning. On leaving school he was intended for the medical profession; but the sensitiveness of his nervous organization not being able to endure anything like a surgical operation, he was obliged to renounce the pursuit. He was then placed under a bookseller; but his mind being more intent on the reading than the selling of books, he was found altogether unsuited for business habits. Being a Dissenter, and having from his infancy a strong religious tendency, he was next located at Northampton, in order to study for the dissenting ministry; but his mind becoming unsettled on religious matters, he left Northampton, and came up to London in 1797, where he soon afterwards entered into the matrimonial state with a lady whose 'Tales for Children' (from the German) obtained in their day considerable popularity. Mr. Crabb next obtained the situation of classical master at Thorp Arch School, in Yorkshire. He did not here remain long; but in 1801 proceeded to Bremen, for the purpose of studying German, and teaching his native tongue for a subsistence. He there remained between five and six years; and on his return to England published his 'German Grammar,' and 'Dialogues in German,' both of which still continue to maintain a deserved popularity. He thenceforward determined on a literary career; and in 1814 went to the University of Oxford, where he graduated B.A. in 1821, and M.A. in 1822. He then entered on the labours of literary compilation, and at the same time closely pursued the study of the law. In 1829 he was called to the bar by the Society of the Inner Temple. But as he was unsuited for forensic pleading, owing to his bashful diffidence, he prudently determined on practising simply as a conveyancer and chamber counsel. He did not, however, receive from the solicitors that amount of support which the reputation of his published legal works ought to have entitled him; and his connection with the law may be

said to have been rather as an author than a practitioner. Of the works on law, which at different times emanated from his pen, may be mentioned his 'History of the English Law' (1829); 'A Digest and Index of all the Statutes at Large' (1841-2); 'The Law of Real Property' (1846); and 'A Series of Precedents in Conveyancing and Common and Commercial Forms' (3rd edition, 1845). But the works for which his name is more generally known, are those of a lexicographical and philological character; the principal of which are his 'Dictionary of English Synonymes;' his 'Technological Dictionary;' his 'Historical Dictionary;' his 'Dictionary of General Knowledge;' and his 'Technical Dictionary of Terms used in Science and Art' (1851). He also left, at the time of his death, several works in manuscript, viz. 'A History of Popery;' 'An Abridgment of Rollin's Ancient History;' 'An Essay on Public and Private Happiness;' and a 'Translation of Theophrastus.' With all these literary efforts, it is melancholy to reflect, that the greater portion of his life was clouded with domestic poverty, which his proud spirit concealed from the world; and this, perhaps, was the chief cause of his comparative seclusion from society. He died at Hammersmith, in 1852.

CRANTARA, a singular custom which prevailed among the northern nations of Europe during the middle ages. In cases of imminent danger the inhabitants were summoned by a kind of alarm-signal, made of a piece of wood half burnt and dipt in blood, and conveyed with all expedition from one hamlet to another. This was the Crantara. The burnt end signified that their house would be burnt if they did not attend; and the cord, at the other end, was to show that they should be hanged, if they neglected the summons. (Olaus Magnus.)

CRASSATEL'LA (Lat. *crassus* thick), a genus of Mollusca, of the family Myadæ, with a solid heavy bivalve shell. From the same word (*crassus*) different genera have received their respective names; as *Crassina*, a genus of the sub-family Venerinæ, with a solid sub-orbicular bivalve shell; *Crassispira*, of the sub-family Columbellinæ, with a small univalve shell, which is sub-clavate and tuberculated. *Crassilabrus* (thick-lipped) is a genus of fishes belonging to the family Chætodonidæ, in which the dorsal and anal fins are without scales at their base, and the ventral fins short. *Crassulaceæ* is a natural order of plants, consisting of succulent shrubs or herbs, as the House Leeks.

CRATEROPODI'NÆ (Gr. *strong-footed*), a family of birds belonging to the order Dentirostres, and generally known as the long-legged thrushes. Their wings are very short, which makes their flight heavy and clumsy; their note is loud and rather unpleasant; their plumage soft and of a sombre hue; they are at once distinguished by the strength and size of their legs. Swainson places them between the Merulidæ, or true thrushes, and Oriôles.

CRE'TINISM (v.90). Saussure, the celebrated naturalist, attributes the numerous examples of Cretinism, or idiotism, with goitres, found in the valleys of the Lower Valais, and the Val d'Aosta in Switzerland, to the stagnation of the atmosphere, and the floating miasmata. These valleys contain low marshy places surrounded by high mountains, where the fresh air does not circulate freely, and the vaporous miasmata are allowed to float around without being dispersed. The reflected rays of the sun too, in summer, act in a very powerful way on the marshy exudations of the valleys, and thus materially contribute, with other causes, to the numerous instances of intellectual incapacity and physical deformity. In the deep Pyrenean valleys the same causes are apt to produce similar results; and we have there numerous instances of idiotism, in the Cagots, who correspond, in some measure, with the Cretins of the Alpine valleys.

CREWE, a town in Cheshire, 38 miles south-east of Liverpool, which, from being an obscure hamlet, has lately risen into notice and prosperity on account of being the central station and depôt of the North-Western railway, from which run the various branches to Chester, Manchester, Warrington, Birkenhead, Liverpool, &c. Several handsome streets and public buildings have lately sprung up, and the population has increased to many thousands. A new church has been erected and endowed, at the expense of the Grand Junction Railway Company. It is built in the form of a cross, with an elegant tower, and is capable of accommodating 700 persons.

CRIME, STATISTICS OF. The returns of the committals for trial at assizes and quarter sessions in England and Wales, from 1844 to 1854, have been published, from which it appears that crime uniformly increases in proportion to the physical deterioration of the people, and *vice versâ*. It appears that in 1844 the number of committals was 26,542; in 1845, 24,303; 1846, 25,107; 1847, 28,833; 1848, 30,349; 1849, 27,816; 1850, 26,813; 1851, 27,960; 1852, 27,510; 1853, 27,057, and in 1854, 29,359. The first year in which the committals increased is 1847, a year of distress, the rise then being nearly 4,000. This rise was maintained with an addition of nearly 1,500 in 1848, likewise a year of distress, partly owing to the same causes as in 1847 (the disastrous operations of the Bank Restriction Act of 1844), and partly on account of political disturbances and apprehensions. In 1849 the causes which before had depressed the condition of the labourer died away. Food was cheap and employment abundant. Emigration had removed many of the working classes, and those who remained at home found the demand for their services increase; and in that year we find the committals decline by nearly 2,500. The succeeding years were likewise seasons of prosperity, and during these the criminal returns exhibit no marked fluctuation. In the last year of the series the number of committals rose by a little over 2,000; but at the same time the condition of the people was impaired, owing to the enhanced price of food and other necessaries of life.

In the census of 1851 it is stated that, 'In 1841, on the census of that year, the commitments were in proportion of 1 in every 573 of

the population. On a similar comparison between the census returns and the commitments of 1851 the proportion is reduced to 1 in 641. 'Between these periods the population increased 12·6 per cent., while the commitments remained stationary.' In 1852 the commitments were 1·6 per cent. less than in 1851. In 1851 the number of prisoners was 1 to every 668 persons. The number of persons in gaols in Ireland on January 1, 1851, was 9984; or 1 in 674 of the whole population.

In London the number of criminals, and the peculiar kinds of crime in which they are engaged, have been reported by the commissioners of police. At the beginning of 1857 they were estimated at 107 burglars, 110 house-breakers, 38 highway robbers, 773 pickpockets, 3,657 sneaksmen, or common thieves, 11 horse stealers, and 141 dog stealers; besides a host of other minor offenders, who swell the number of criminals in London to nearly 17,000 known to the police.

CRIMEA (v. 95). Since our account was written the Crimea has been the scene of important military operations. Soon after the declaration of war against Russia, on the part of England and France, in 1854, the united armies of the two countries left Varna in steam ships and sailing transports; and, on the 14th of Septemtember, landed at Old Ford, near Eupatoria. They immediately advanced towards Sebastopol, and on the 20th occupied the northern bank of the river Alma. They there saw the Russians placed in a strong position along two miles of the high ground on the southern bank. The Allied armies advanced to the attack of the Russian position, and, after a sanguinary encounter, defeated the enemy, and took possession of their batteries. The Russians fled, leaving 700 prisoners, and 4,000 wounded on the field of battle. The loss on the Allied side was about 600 killed, and about 2,600 wounded.

The Allied armies then proceeded south from the Alma upon Sebastopol, and on the 24th, halted at the village of Belbek. Here, finding the Russians strongly posted on the river, the Allies took a détour, and proceeded on unmolested towards Balaklava, which was taken possession of on the morning of the 26th; several steamers and transports having already entered the harbour. The siege of Sebastopol commenced on the 17th of October. On the 25th the Russians made their appearance, to the number of 25,000, in the valley of Balaklava, with the evident intention of cutting off the besieging army from its base of operation, but were signally defeated. [BALAKLAVA, *Supplt.*] On the 5th of November was fought the battle of Inkerman. [INKERMAN, *Supplt.*] While the operations of the siege were being carried on with great slaughter on both sides, an expedition to Kertch sailed on the 24th of May, 1855. The Russian garrison in the place fled at the approach of this squadron, first blowing up the magazines, and destroying the stores. The Allies proceeded to Yenikale, which was garrisoned. The war steamers captured and destroyed about 250 vessels, laden with grain, supposed to be the supplies of the Sebastopol garrison. Arabat and Genitch were similarly visited, and immense quantities of Russian stores destroyed. At Arabat a magazine was blown up. The whole sea of Azoff was scoured, and the corn supplies intended for Sebastopol cut off. During the month of May the Sardinian contingent of 15,000 men arrived. 20,000 French, the whole of the Sardinian force, and 20,000 Turks marched for the Tchernaya heights. Being evacuated by the Russians, the Allies occupied the position. On the 6th of June the French attack on the Mamelon took place, and in a few minutes they had full possession of it. On the capture of the Mamelon, the trenches of the besiegers ware pushed out towards the Malakoff and the Redan. On the 16th of August was fought the battle of the Tchernaya. The Russian force crossed the river at several points; but it was attacked from all sides by an unerring fire from the English, French, and Sardinians, and hurled back to its former position. The Russian loss, on this occasion, was estimated at 5,000 or 6,000 killed and wounded. On the 9th of September the south side of Sebastopol was evacuated by the Russians, in consequence of the deadly fire of the Allies, and the successful attack and capture, by the French, of the Malakoff Tower. In leaving the place the Russians burned all the buildings, blew up the magazines, and destroyed the remaining ships of the Black Sea fleet in Sebastopol harbour. The siege of the south side of Sebastopol lasted 316 days, reckoning from the time the fire was first opened on the 16th of October, 1854. [SEBASTOPOL, *Supplt.*]

The capture of Sebastopol soon led to the Peace of Paris, in March 1856, when the Crimea was evacuated by the combined forces of England, France, and Sardinia.

CRINOI'DEANS (Gr. κρίνον a lily, and εἶδος resemblance), in geology, an order of lily-shaped Zoophytes, whose fossil remains are so abundant in the great Silurian strata as to constitute formations entirely consisting of their calcareous skeletons, many miles in extent, and of a considerable thickness. The animal has been described by Miller as consisting of 'a round, oval, or angular column, composed of numerous articulating joints, which form a cuplike body, containing the viscera, from whose upper rim proceed fine articulated arms, dividing into tentaculated fingers, more or less numerous, surrounding the aperture of the mouth.' The small bead-like plates which constitute the skeletons of these animals, often form entire beds of limestone many feet in thickness. Some of them are beautifully radiated, and familiarly known, in the northern counties, as St. Cuthbert's beads, on account of the vast number of ossicula, or little perforated bones, which were formerly used as rosaries, and can be strung together like beads when found detached. The lines found in Sir Walter Scott's 'Marmion,' are allusive to this circumstance:

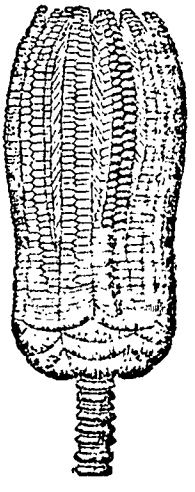
> 'On a rock by Lindisfern
> St. Cuthbert sits, and toils to frame
> The sea-born beads that bear his name.'

In the tumuli of the ancient Britons, many of these perforated ossicula of the crinoideal family

have been found, which, it is presumed, had been worn as ornaments by the deceased. In Derbyshire, near Cromford, extensive beds of limestone, composed of crinoideal fossils, have been discovered, and are often worked for chimney-pieces and other ornamental decorations.

The cavities of the columns and ossicula of these fossils (says Dr. Mantell) are often filled with white calcareous spar, while the ground of the marble is of a dark reddish-brown colour.

There are various genera and species of Crinoideans; but the two genera which have attracted the most attention, are those with a pentagonal stem, called *Pentacrinites*, and those with a circular stem, named *Encrinites*, which have the nearest resemblance to the external form of the lily [ENCRINITES]. Nearly all the species in the older Silurian formation have this circular stem; but they became extinct before the formation of the blue lias. The species called *Encrinites moniliformis*, which is very abundant, may be considered as the best type of the crinoidal family, as represented in the annexed engraving.



THE BEAD-FORMED FOSSIL LILY, OF THE CRINOIDAL FAMILY.

The chief living representative of those vast swarms of crinoidal life, which were among the earliest inhabitants of the ocean, and whose petrified bones still form a mighty extent of strata in America and Northern Europe, may be found in the depths of the seas which encompass the Antilles. This is a very rare crinoidal animal, which has received the distinctive appellation of *Pentacrinus Caput Medusæ*. It consists of a column formed of an infinite number of pentangular joints, whence the name is derived.

(Miller; Mantell; Ansted; Milner.)

CROCKARDS, foreign coins of base metal, which obtained circulation in this country during the thirteenth century. By stat. Edward I. c. 3, they were prohibited under severe penalties. (Blackstone.)

CROKER, RT. HON. JOHN WILSON, was born in 1780, in the county of Galway. He was educated at Trinity College, Dublin, and in 1802 called to the Irish bar. He entered the House of Commons in 1807, for Downpatrick, and subsequently sat in eight successive Parliaments. In 1809 he was appointed Secretary of the Admiralty. He also became a Fellow of the Royal Society in 1810, D.C.L., LL.D., a Fellow of the Asiatic Society, and other learned associations. In 1809 he joined Mr. Canning, Walter Scott, George Ellis, and others, in setting up the *Quarterly Review*, of which he remained, for forty years, one of its most virulent and slashing reviewers. It was in the *Quarterly Review* that this disappointed politician vented his embittered feelings, as he himself avowed. According to the *Daily News*, which published a lengthened memoir of him, Mr. Croker declared, when Lord Grey came into office, that he did not consider his pension worth three months' purchase; that he should therefore lay it by while he had it, and make his income by 'tomahawking' liberal authors in the *Quarterly*. He did it not only by writing articles upon them, but by interpolating other people's material with his own sarcasms and slanders, so as to compel the real reviewers, in repeated instances, to demand the republication of their articles in a genuine state and a separate form. In 1828 he became a Privy Councillor, and he retained his Admiralty office till 1830. It was the Reform Bill that destroyed him politically. He declared that he would never sit in a reformed House of Commons, and he never did. His political action, for the rest of his life, consisted merely in the articles he put forth in the *Quarterly Review*—articles, which (to say nothing of their temper) showed such a total incapacity to comprehend the spirit and needs of the time, and such utter recklessness about truth of both statement and principle, that elderly readers are puzzled to account for the expectations they once had of the writer.

Croker was the author or editor of various works, the chief of which is his edition of 'Boswell's Johnson,' a book on which he spent much labour, and which was regarded with high and trustful favour, till Mr. Macaulay overthrew its reputation for accuracy by an exposure of a singular series of mistakes, attributable to indolence, carelessness, or ignorance. His other works of bulk are 'The Suffolk Papers,' the 'Military Events of the French Revolution of 1830,' a 'Translation of Bassompierre's Embassy to England,' the 'Letters of Lady Hervey,' and 'Lord Hervey's Memoirs of the Reign of George II.'

Mr. Croker was an intimate acquaintance of the late Lord Hertford, and his social footing was not improved by the choice of such friendships, as was proved by the revelations made on the trial of Lord Hertford's valet. In short, his best place was the desk at the Admiralty; his best action was in his office, and the most painful part of his life was the latter portion, when he had acquired an ignoble social reputation, and when political odium was attached to him by Mr. D'Israeli's delineation of him in 'Coningsby.' This virulent reviewer found in his old age the truth of the Eastern proverb, 'Curses are like chickens,

they always come home to roost.' He died in 1857.

CROKER, THOMAS CROFTON, F.S.A., author of 'The Fairy Legends of the South of Ireland,' &c. He was the son of Major Thomas Crofton, of the 38th Foot, and was born at Cork in 1798. He had from his boyhood a taste for literary and antiquarian pursuits, and possessed a ready skill in making graphic sketches, which proved of great use to him in his future pursuits. At a very early period he commenced his collections of the 'Songs and Legends of the Irish Peasantry;' and his observations of their manners and character are pleasantly delineated in many of his subsequent writings. Soon after the death of his father, in 1818, his mother's interest with Mr. Wilson Croker, then Secretary of the Admiralty, procured him the appointment of clerk in that department, at a salary of 100*l.* per annum. But writing a steady mercantile hand, and having devoted some attention to lithography, he succeeded in introducing that useful art into the Admiralty, as a substitute for transcribing multifold copies of the same document. He was then appointed superintendent of the lithographic department, and subsequently became a clerk of the first class at a salary of 800*l.* In 1850 he was placed on the retiring list, with a pension of 500*l.*

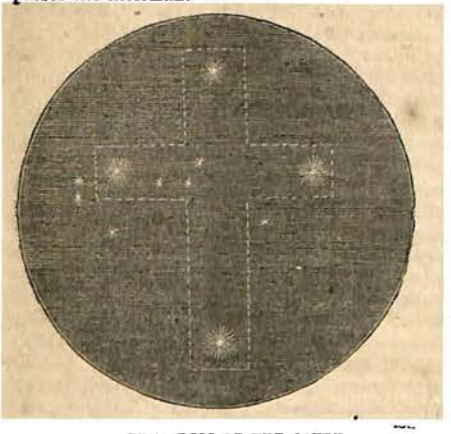
Such are the leading features of Mr. Croker's official life. But during the above period he had closely devoted himself to literature, and especially to the legendary lore of his native country. In 1824 he brought out his first work, 'Researches in the South of Ireland;' the notes of which were formed, partly from his early wanderings, but chiefly from a tour made through the counties of Cork, Waterford, and Limerick in the year 1821. In 1825 he published his well-known work 'The Fairy Legends and Traditions of the South of Ireland,' which acquired an extensive popularity, and have been translated into several of the continental languages. At this time Mr. Crofton appears to have been on intimate terms with most of the literary stars of the day. In 1826 he had a personal introduction to Sir Walter Scott, at the residence of Mr. Lockhart in Pall Mall, which meeting has been thus chronicled in the journal of the great novelist:—'At breakfast, Crofton Croker, author of 'The Irish Fairy Tales,'—little as a dwarf, keen-eyed as a hawk, and of easy prepossessing manners—something like Tom Moore. Here were also Terry, Allan Cunningham, Newton, and others.' Mr. Croker was a very general contributor to the various literary annuals, and other periodicals of the day; and in 1827 he undertook the editorship of 'The Christmas Box,' which was ably supported by the contributions of Miss Edgeworth, Sir Walter Scott, Theodore Hook, Dr. Maginn, Mr. Lockhart, and other distinguished literates. About this time Mr. Croker aided in the formation of the Society of Noviomagians, of which he was perpetual president. In 1829 he published 'The Legends of the Lakes; or, Sayings and Doings at Killarney,' chiefly collected from the manuscripts of Mr. Lynch. A second edition of this work appeared as a 'Guide to the Lakes,' in 1831. In 1832 he brought out two novelettes, the first entitled 'The Adventures of Barney Mahoney;' and the next, 'My Village versus Our Village.' He also undertook the editorship of various works; among others, 'The Popular Songs of Ireland,' which appeared in 1839. About this period he took a leading part in the formation of the Camden and Percy Societies, and also in the establishment of the British Archæological Society, to each of which he was an indefatigable and a valuable contributor. He died at Old Brompton in 1854.

CROMBIE, REV. DR. ALEXANDER, a voluminous writer, and the learned pastor of the Presbyterian Meeting-house in Southwood Lane, Highgate. He was born at Aberdeen in 1760, and educated at Marischal College, where he took his degree of LL.D. in 1798. For seventeen years he kept a private school at Highgate, and also at Greenwich, with distinguished success, and retired with an ample fortune. He died in 1842; and the Earl of Ripon, in his annual address to the Royal Society of Literature, made the following observations. 'The name of Dr. Crombie is familiar to all who take an interest in the education of youth. He was, for the greater part of a long life, employed in the discharge of the important duties belonging to that pursuit; in furtherance of which he wrote and published some useful works. I allude particularly to his "Gymnasium," in which he laid down rules for Latin Composition, in a manner easy of comprehension, and characteristic of an enlightened scholar.' Among other works he published a 'Defence of Philosophical Necessity' (1793); —the 'Etymology and Syntax of the English Language explained' (1802), which passed through several editions;—'Gymnasium, sive Symbola Critica,' intended to assist the classical student in his endeavours to attain a correct Latin Prose Style' (1812), of which various editions have been published;—'Clavis Gymnasii, sive Exercitationes in Symbolam Criticam' (1828);—'Letters on the Agricultural Interest' (1816);—'Natural Theology, or Essays on the Existence of Deity and of Providence, on the Immortality of the Soul, and a future State' (1820);—'The Strike' (1834);—a pamphlet on the 'Ballot' (1838);—and numerous articles in the *Analytical Review*, *Edinburgh Review*, and other periodicals.

CROMLECHS (v. 106). There appears some difference between the cromlechs of the primitive Britons and those of the Scandinavian nations. The former are flat stones, in an inclining position, supposed for the purpose of sacrificing victims; the others are round and thick stones, standing on a small hillock, and covering a cave. The Celtic and old German modes of worship being mere varieties of Druidism, accounts for the existence of cromlechs in different parts of Germany. Mr. Downs, in his 'Letters from Mecklenburgh and Holstein,' has published some interesting information on the subject. He says that 'the cromlech was an altar for sacrificing, and that there was one in the village of Bedel, near the inner Elbe, surrounded with oaks in a garden; that was it customary to offer sacrifices on these cromlechs

before a person began ploughing, and before he was married; that no one entered this grove without making a present; and that no one swept the cave under the cromlech without finding money.'

CROSS, CONSTELLATION OF THE, one of the most interesting stellar objects of the southern hemisphere. It consists of four brilliant stars of the first magnitude, which present a cruciform appearance; the two right and left stars pointing directly east and west, and the upper and lower ones being the astronomical pointers to the south-pole. Its celestial motions have been well described by Humboldt. The two great stars (says he) which mark the summit and the foot of the Cross, have nearly the same right ascension; and it therefore follows that the constellation is almost perpendicular at the moment when it passes the meridian.



THE CROSS OF THE SOUTH.

This circumstance is familiar to every nation that lives beyond the tropics, or in the southern hemisphere. It is known at what hour in the night, in different seasons, the southern cross is erect, or inclined. It is a time-piece that advances very regular nearly four minutes a day; and no other group of stars exhibits to the naked eye an observation of time so easily made. In the southern hemisphere it is a common remark, that 'Midnight is past; the Cross begins to bend.'—Baron Humboldt has recorded his feelings in his first view of this radiant constellation. In the sixteenth degree of latitude (says he) we saw, for the first time, the Cross of the South. The pleasure felt on discovering it (he observes) was warmly shared by such of the crew as had lived in the colonies. 'In the solitude of the seas we hail a star as a friend, from whom we have been long separated. Among the Portuguese and the Spaniards peculiar motives seem to increase this feeling. A religious sentiment attaches them to a constellation, the form of which recalls the sign of the faith planted by their ancestors in the deserts of the New World.' And our own sweet poetess, Mrs. Hemans, has thus entered into the spirit of an ancient Spanish settler in the New World:—

'Thou recallest the age when first o'er the main
My fathers unfolded the ensign of Spain;
And planted their faith in the regions that see
Its unperishing symbol emblazoned in thee.'

CROSS AND BALL, an emblem frequently seen on Christian edifices, or in connection with the regalia of Christian kings or prelates of the church. It has evidently been transmitted from the earliest periods of antiquity. Thus the statues and figures of Egyptian delineation are generally represented with the cross and ball; the circle signifying the presence of the world, and the cross being the monogram of Hermes, or Thoth (σ), by whose wisdom the world is governed. It is seen in the hands of almost all the Egyptian statues. The symbol of the cross and ball has also been considered the key of the Nile.

CROSSES (v. 114). From the crucifixion of our Saviour, the cross has for ages been the sacred emblem of Christianity; and the model of all Christian churches has been taken from its form. But on reverting to the early periods of antiquity, we find that the cross has been generally used as an implement for the execution of criminals; and this mode of execution was called by the Romans *crucifixion*. The custom was in use among the Jews, Egyptians, Greeks, and Asiatics. The punishment was inflicted in a variety of ways; sometimes by hanging the malefactor upon the cross in an erect position; at others, by suspending his head downward. On the establishment of Christianity by Constantine, this kind of punishment, which had existed among the Romans till his time, was altogether abolished; and the cross became the sacred emblem of religion. Thus many of the Christian kings were in the habit of erecting crosses before a battle, or any great enterprise, with the view of supplicating the aid of the Almighty; and in almost every town, which had a religious foundation, these crosses were erected.

CROTALIDES (Gr. κρόταλον a rattle), a family of poisonous serpents, belonging to the order Ophides, of which the *Crotalus* (rattlesnake) is the type, and is so termed from being furnished with a rattle at the extremity of the tail. The upper jaws of these reptiles are all furnished with poisonous fangs, which render their bite so dangerous or fatal.

CRO'TALUM. [CASTAGNIETTA.]

CROW OF DUILIUS, a kind of wooden bridge erected at the prow of the Roman war vessels, and invented by the naval commander whose name it bears. When the Roman vessel came in contact with an enemy, one end of the crow was raised by a pully, and suddenly let fall aboard the opposing ship, when the spike held it fast, and firmly attached the two together. By this means the boarders were enabled to fight in the same manner as on solid ground, which, from the physical prowess of the Romans, gave them a great advantage. Thus while the two vessels were grappling together, side by side, the Romans, leaping from all quarters into the enemy's vessel, were not long, with their heavy shields and short swords, in obtaining undisputed possession. It was chiefly owing to this invention that Roman prowess prevailed, with very inferior numbers, over

the nautical skill of the Carthaginians, at the celebrated battle of Ecnomus, in which the enemy's fleet amounted to 350 galleys, and 150,000 men. (Nuttall's *Class. Dict.*)

CROWNS (v. 118-19). In the earliest ages of mankind crowns appear to have been devoted to the statues of the deities; but, in the course of time, when sovereigns began to be looked upon as demi-gods, crowns were conferred upon kings and emperors. Among the Jews the high-priest wore a crown; but there is no mention in Scripture of a royal crown being worn by kings till the time of Saul and David. Among the Romans, however, the crowns were generally worn as the highest marks of honour and distinction. Thus radiated crowns, with twelve points, were worn by their ancient emperors; but the first Roman who appears to have worn a crown was Tarquin, B.C. 616. It was at first a mere fillet, and then a garland, which, in succeeding times, was adorned with pearls. The use of the crown, however, was not confined to sovereign dignity. In subsequent ages crowns were bestowed on individuals as the reward of distinguished merit. Thus the *corona castrensis* was a crown of gold given to a soldier who first mounted the rampart, or entered the camp of an enemy; and the *corona muralis* was a crown presented to him who first scaled the walls of a city in an assault. The *corona triumphalis* was a crown first of laurel, and afterwards of gold, worn by those generals who had enjoyed the honour of a triumph. The *corona navalis* was a golden crown, presented to him who first boarded the ship of an enemy, or otherwise distinguished himself in a naval action. It was adorned with figures resembling the beaks of ships, precisely as the mural crown bore some resemblance to a battlemented wall. But the highest and most honourable reward was the *corona civica*, or civic crown, bestowed on him who had saved the life of a citizen. It conferred especial honours on the possessor; and he had the privilege of wearing it at all the public spectacles as a distinguishing mark of respect.

In England, Alfred is said to have been the first sovereign who wore this symbol of kingly authority, which was A.D. 872. In 929 Athelstan wore a coronet, somewhat similar to that of a modern earl's. In 1053, Pope Damasus II. introduced the papal cap; and shortly afterwards William the Conqueror added a coronet with points to his ducal cap. It was not until the era of John XIX. (1276) that the papal cap became encircled with a crown. Boniface VIII. added a second one; and about the year 1334, Benedict XII. completed the *tiara*, or triple crown. We read that in 1386, Richard II. had occasion to borrow 2000*l.* from the city of London, for which he placed his *crown* and regalia in pledge. The crosses which now appear on the crowns of England were introduced by Richard III. in 1483; and the arches by Henry VII. in 1485.

CRYPTIDÆ (Gr. κρυπτὸς hidden), a family of hymenopterous insects, in which the abdomen is always petiolated, and the ovipositor exserted.

CRYSTAL PALACE, the name of a magnificent structure, erected at Sydenham, in the county of Surrey, about seven miles from London; and so called from its being entirely constructed of glass, bound together by massive iron ribs and lightly constructed frame-work of the same material. It was designed by Sir Joseph Paxton; and the style of architecture is not only graceful, but altogether unique in the annals of European art. It originated from the Great Exhibition of National Industry, which was opened in Hyde Park in 1851; of which a brief notice, as introductory to our present account, may be interesting.

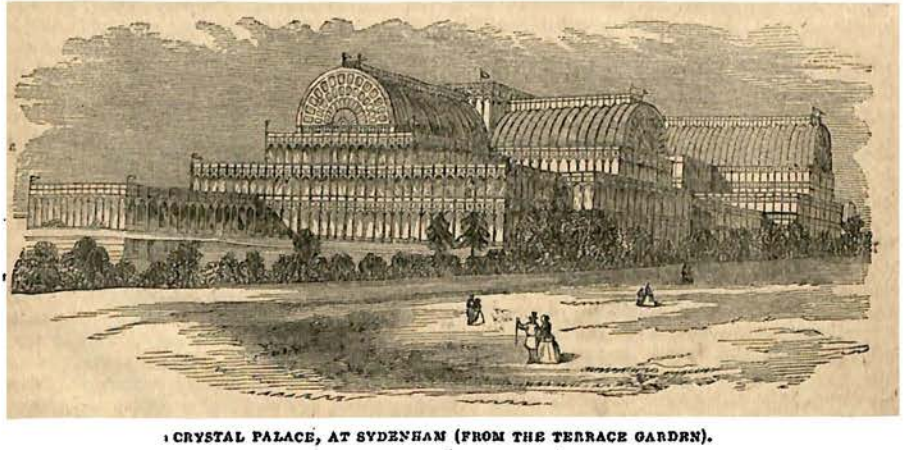
The National Exhibition of 1851 was first projected by Prince Albert, and the first practical measure for promoting the objects in view was adopted in January 1850, when Her Majesty appointed a royal commission for taking the project into consideration, and, if practicable, to carry it into effect. A building committee was also appointed; but none of the various plans submitted to them met with approval, until the inventive genius of Sir Joseph Paxton gave to the world a plan which appeared in every respect adapted for the purposes required. Though the design was considered as entirely novel, it was, in reality, a mere extension of the principle of a vast glass-house, adopted by Sir Joseph in his construction of a Victoria Regia house at Chatsworth. This plan having been agreed upon, Messrs. Fox and Henderson undertook the erection. It occupied nineteen acres of ground, and was completed within seven months. It measured 1848 feet in length, and 456 in width. It admitted of a frontage, for the exhibition of works of art, of more than ten miles in extent, and was capable of containing, at one time more than 93,000 persons. In the construction of this extraordinary edifice, 3000 tons of cast iron, 700 tons of wrought iron, 600,000 cubic feet of timber, 896,000 square feet of glass, weighing 400 tons, were placed within 400 miles of grooves of sash-bars; and the rain which fell upon these nineteen acres of glass was conveyed away by channels and gutters 24 miles in length. The building stood upon 3300 iron columns, of 19 and 17 feet in height; the galleries and roof were supported, and the columns made rigid, by 2522 iron girders, of 24, 48, and 72 feet in length, and of 3 and 6 feet in depth.—On the 1st of May, 1851, the Exhibition was opened, in state, by the Queen and Prince Albert. The price of admission, in the first instance, was 1*l.*; afterwards 5*s.*; and, eventually 1*s.* The aggregate number of admissions, on payment of 1*s.*, was 4,439,419. The daily average of visitors, was about 30,000; but on Monday the 6th of October, five days before the final close, the number of visitors was 107,815; on Tuesday, 109,915; and on Wednesday, 109,760. The largest number in the building, at one time, was 93,224. The total sums received for admission to the doors was 356,808*l.*; for season tickets, 67,514*l.*; and for refreshments, 75,000*l.* The gross receipts, from all sources, amounted to 506,100*l.*; and, after the payment of all expenses, there remained a surplus of 170,000*l.* The total value of the goods sent for exhibition from

the United Kingdom was 1,031,607*l.*, from our colonies, 79,901*l.*, and from foreign countries, 670,420*l.*, making a grand total of 1,781,929*l.*

On the close of the Exhibition, the propriety of its removal for some time agitated the public mind; but at length, in conformity with the terms of the deed of the Commissioners, its destruction was determined on. In the mean time a public company was formed for the erecting of another crystal palace on the ruins of the former one; at the head of which a body of able and practical men were appointed as Directors. The Company obtained a Charter of Incorporation; and on the 24th of May, 1852, they effected the purchase of the materials of the old edifice. They also proceeded to complete the purchase of the necessary land on which to erect the new Crystal Palace. They succeeded in obtaining some extensive park lands, to the extent of 349 acres, for 167,661*l.* The grounds were picturesquely situated near Sydenham, at a convenient railway distance from London. The plan of the building and of its extensive grounds was then prepared and carried into effect by Sir Joseph Paxton, and several able coadjutors. The first column was raised on the 5th of August, 1852; and the entire edifice was completed in the summer of 1854, at a cost of nearly a million of money, which was thus expended:—

Purchase of land, after deducting the sums received for resales	£50,240
Construction of building	306,176
Erecting grand terraces and water-works	305,384
Fine Art Courts	102,500
Sculpture	32,000
Natural History and Geology	15,176
Fittings and internal decorations	£39,450
Roads and approaches	19,350
General charges	56,686

The new Crystal Palace stands nearly north and south on the summit of Penge Hill, and is constructed almost entirely of glass, bound together with ribs and frame-work of iron. The entire length is 1608 feet, and the wings 574 feet each, making a length of 2756 feet, which, with the 720 feet in the colonnade, leading from the railway station to the wings, gives a total length of 3476 feet. The width of the nave or main avenue is 72 feet, and the height 68 feet; the height from the flooring to the crown of the arch is 104 feet. The building has a magnificent transept in the centre, and one at each end. The centre transept is a vast circular roof 120 feet in diameter, which rises majestically over the circular roof of the nave. The length of the central transept is 384 feet; its width 120; its height, from the floor to the top of the louvre, is 168 feet, and from the garden front to the top of the louvre, 208, which is six feet higher than the Monument. These transepts, with their aisles, advance from the main line of the building, and thus present a most agreeable *tout ensemble*. The ends of the edifice extend into large wings, which project to a considerable distance forward into the grounds. These wings are terminated with grand glass-towers, from which may be obtained extensive views of the gardens, fountains, and grounds, and also an extensive and picturesque view of the surrounding country. The area of the ground-floor, including the wings, amounts to 598,396 superficial feet. In cubic contents the entire building exceeds its predecessor by nearly one-half.



CRYSTAL PALACE, AT SYDENHAM (FROM THE TERRACE GARDEN).

The contents of the interior are very dissimilar from those which adorned the Hyde Park Exhibition. The whole of the sides of the nave, the transept, and the divisions on either side, between the several courts of which the interior consists, are adorned with trees and plants of every clime; the whole being interspersed with fountains, statues, and other works of art. On the north-east side are ranged, in consecutive order, the historical galleries of architecture and sculpture, with casts of the finest remains of ancient art. On the south-east side of the nave there are similar collections of mediæval antiquity. The south-west and north-west divisions of the building are devoted to the exhibition of manufactures and productions of practical utility. On the lower story, on the Park

side, is a gallery, 24 feet wide, which is chiefly devoted to the exhibition of machinery; and around the upper part of the interior is another 24 feet gallery, runing entirely round the building, which is applied to the productions of manufacturing art. The different courts which range along the two sides of the great nave are all of an historical and artistic character, and highly interesting; but as they are fully described in the guide books, a lengthened description is here unnecessary. The principal courts are the Egyptian, the Greek, the Roman, the Pompeian, the Alhambra, the Assyrian, the Byzantine, the Mediæval, the Renaissance, the Italian, the fine arts, the classical sculpture, the modern sculpture, and the German and English sculpture. There are also various courts for exhibiting the productions of manufacturing industry; as the French, the mixed fabrics, the printed fabrics, the musical instruments, the Sheffield, the Birmingham, the stationery, &c.

The gardens lie on the south front of the Palace, and are laid out on the most magnificent and extensive scale. The fountains, lakes (with their antediluvian monsters), stalactite caverns, walks, and picturesque undulations of the ground, are not to be surpassed in any part of Europe. During the summer months the fountains and cascades are brought into full play for the gratification of the visitors; and a more interesting spectacle cannot well be imagined. The magnitude of these fountains may be conceived from the circumstances that, when the great waters are in full operation, there are 11,788 jets playing; and the display of water amounts to about 120,000 gallons per minute.

The Italian, or terrace garden, which extends along the whole front of the building, is 400 ft. wide, and occupies a space of thirty acres. The upper terrace is a grand and imposing structure, 1700 ft. in length, 18 ft. high, and 50 ft. broad. It is ornamented, along its entire length, with a handsome ballustrade and stone-facing. Opposite to the three transepts there are three bold flights of steps, which lead from the upper terrace to the terrace garden below. They are adorned with numerous fountains, flower-beds, and groups of statuary, where the beauty of the terrace and gardens are shown to the greatest advantage.

CRYSTALLO-ENGRAVING, an art which consists in taking fac-similes of casts or dies from intaglios, and compressing them in intaglio on hollow glass-vessels. The process is thus described in 'Novelties, Inventions,' &c.:—'The die or cast is sprinkled over first with Tripoli powder, then with fine plaster and brick-dust, and then with coarse powder, of the same two materials; it is under a press, and at the same time exposed to the action of water, by which the layers become solidified into a cast. This cast is placed in the iron mould, in which the glass-vessel is to be made, and becomes an integral part of the vessel so produced; but by the application of a little water the cast is separated, and leaves an intaglio impression upon the glass as sharp as the original die. The cast or cake thus used, however, seldom suffices for a second impression.'

CUBITT, THOMAS, the eminent builder, and sole architect of his own fortunes, was born at Buxton, near Norwich, in 1788. He was brought up as a carpenter; and, when about twenty-one years of age, commenced a small business in the metropolis. About six years after this humble beginning, he took a tract of ground from Lord Calthorpe, in Gray's-inn Road, on which he erected large workshops. While there, one of his earliest works was the London Institution in Moorfields. In 1824 he entered into engagements with the Duke of Bedford and Lord Southampton for building on those extensive tracts of ground on which Tavistock Square, Gordon Square, Woburn Place, and other fashionable streets now stand. In the following year he engaged, with the Marquis of Westminster and Mr. Lowndes, to build on portions of Five Fields, Chelsea, and other adjacent grounds, which were then comparatively unremunerative. The result of this great undertaking was the erection of what may now be considered as the most fashionable portion of London, viz. Belgrave Square, Lowndes' Square, Chesham Place, and other splendid ranges of houses. Not satisfied with this, he entered into a farther engagement to cover that extensive waste of grounds between Eaton Square and the river Thames, now known as South Belgravia. His vast building operations were not confined to the metropolis, evidence of which is afforded by the splendid pile of buildings at Kemp Town, Brighton, and other places. During the progress of these vast undertakings he was sent for by the Queen to superintend the re-construction of Osborne House, in the Isle of Wight; and was also employed as builder on various government works of great magnitude. Through life he was the unvarying friend of his numerous workmen and dependents; and ever anxious to promote their social and intellectual progress. He succeeded in realizing a very large property; his personal estate alone, at the time of his death, which took place in 1855, exceeding one million sterling.

CUMBERLAND, County of (v. 147–53). According to the census of 1851, the population of the entire county was 195,492; of which 96,244 were males, and 99,248 females. Of houses, inhabited, there were 37,278. The population of the principal parishes and towns was as follows:—

Alston	2,005	Longtown	2,142
Botchergate	7,431	Maryport	5,698
Brampton	3,074	Penrith	6,668
Carlisle	26,310	Preston Quarter	5,102
Caldewgate	7,693	Rickergate	2,915
Cockermouth	7,275	Whitehaven	916
Egremont	2,049	Wigton	4,224
English Street	3,632	Workington	5,837
Keswick	2,618		

CUMMINGTONITE, a mineral first discovered at Cummington, in Massachusetts, whence its name. It occurs in fine needles, which form tufts of crystals, that slightly diverge from each other. It is opaque, and of a grayish white colour. Its specific gravity is 3·30; and its constituents are silica, 56·54; protoxide of iron, 21·67; soda 8·44; protoxide of manganese, 7·8; loss from heat, 3·18.

CURE'TES, among the classical ancients, a certain order of priests, similar to the Corybantes. They were, strictly speaking, the priests of Cybele, and most numerous in the Isle of Crete. According to some writers they sprang from Phrygia, and were originally what the Druids and Bards were among the ancient Gauls and Germans.

CU'RIA (Lat. *cura* care, or *curo* to conserve), a division, or portion of the three tribes, into which the Romans were divided by Romulus; each tribe being divided into ten curiæ, or wards, something similar to our parishes. Each Curia held its meetings, and kept its feasts, in the temple or edifice publicly appropriated to its use. It also elected a priest, for the performance of religious services, who was called the *Curio* of the ward, or parish; whence, probably, our term *Curate*. He was subject to the authority of the *Curio Maximus*, who was appointed by the assembly of all the Curiones, and whose authority extended over all the Curiæ. The term *Curia* was also applied to the public edifice at Rome, where the citizens, or inhabitants of each Curia, met, for the transaction of local business, or the performance of divine worship. These edifices, or Curiæ, were of two kinds, civil and sacred. In one of the former the senate was in the habit of meeting to deliberate on affairs of state; and in the latter, the priests of religious orders met for the regulation of sacred matters. The most celebrated Curiæ were, the *Curia Hostilia*, built by Tullius Hostilius, *Curia Pompeii*, where the senate effected the death of Julius Cæsar, and *Curia Augusti*, the Court of Augustus.

These Curiæ continued to prevail in the middle ages, when, at the principal festivals of the year, the king of England called together assemblies of the bishops, peers, and distinguished personages. At these meetings they consulted about the civil and ecclesiastical affairs of the state, precisely as did the Romans, from whom the custom was evidently derived.

CURRENCY, the circulating medium of a state, issued by authority, either as coin or in the form of paper, commonly called *Money*. The due regulation of the currency, and adapting its amount to the legitimate demands of commerce, is one of the most difficult problems with which the statesman has to contend. Either excess or deficiency may be equally injurious. In the former case, money becomes depreciated in value; and in the latter, increased beyond its nominal or intrinsic worth. Thus, during the protracted French war, gold, owing to its scarcity, maintained a high price; while the paper currency on account of its excess, became depreciated; and yet, so long as confidence existed, it answered all the purposes of trade and commerce. In 1819 a law was passed for resuming cash payments, and rendering the notes of the Bank of England convertible into gold at the pleasure of the holder. Consequently the gold and the paper preserved an equal value in the purchase of commodities. But in 1844 an Act was passed which limited the issue of paper to the amount of the Government securities and the quantity of gold in the coffers of the Bank; this had a tendency materially to circumscribe the currency, and thus raise the value of money in the trading concerns of life. So long, however, as the gold was in sufficient abundance, and the Bank was enabled to issue a corresponding amount of paper, no injurious effects were felt; but in 1847, when there were great demands for gold abroad, owing to the deficiency and extensive purchases of grain, and the vast increase of our domestic trade, the tremendous evils of that Act became manifest; for at the very time when an enlargement of currency was necessary, the Bank of England was compelled to withdraw its notes in proportion to the amount of gold abstracted from its coffers. The currency was thus inadequate to the public wants. Money and discounts rose to an enormous premium; many respectable trading firms were annihilated; and the prospect of national ruin everywhere presented itself. At this fearful crisis, the ministers were obliged to suspend the law, and permit the Bank, in violation of that law, to issue an excess of paper currency, and adapt the amount to the wants of the community. This afforded immediate relief. A Parliamentary Committee was formed to consider the subject, but it terminated in nothing. In 1857 the same fatal crisis was allowed to return, which resulted from precisely the same causes,—the drain of gold for the Crimean, the Persian, and the Indian wars, and the ruinous withdrawal of our paper currency, at the very time when our domestic trade required an enlargement. A repetition of the ruin and distress of 1847 spread over the land. The ministers of state were again compelled to break through their own disastrous law, in order to restore public confidence, and prevent the actual suspension of cash payments, owing to the tremendous run upon the Bank for gold. The plague-spot of the land was instantly stayed; ministers obtained indemnity from Parliament; and again appointed a Commission to consider the subject, as if we had not already had sufficient experience of the disastrous evils of the currency Act of 1844.

It is thus manifest that a deficiency in the currency or circulating medium of a country, is as great an evil as the shortness of food, water, or any essential commodity of life. The corn and navigation laws have been abrogated, because they did not allow a free trade in food, but limited its quantity; and the same principles must be extended to the currency of the country. A deficiency in the circulating medium, necessary for the commercial and manufacturing industry of the community, is as prejudicial to the body politic as a deficiency of food to the population of the country. To restrict the necessary circulation, and limit the amount of industrial enterprise to that restriction (instead of augmenting the circulation agreeably to the quantity of labour required for the productions of industry) is like attempting to limit the population to the quantity of food which a given spot could produce, instead of increasing it in proportion to the wants of an ever-augmenting population. In fact, all legislation on these matters appears to have been in utter violation of the laws of Providence. It has proved a curse, instead of a blessing, to the coun-

try. The corn, the navigation, and the currency laws have each been productive of the most mischievous consequences; and all we now require is that the last, like the two preceding, may be entirely erased from the statute book, and the industrial energies of the nation be allowed a fair and open field for its operations, instead of being eternally crippled by legislative shackles.

The whole currency question (which is now undergoing the process of mystification by a Parliamentary Committee) is, whether we are to adapt our circulation to the increased demands of public enterprise, or we are to limit that enterprise to the restricted circulation of the country. Common sense would advise the former course; and it is for the industrial portion of the community, who flourish on public enterprise, to enforce the necessity of this principle on the attention of the legislature. All we require is a sufficiency of the circulating medium for the wants of industry; not a quantity of gold locked up in the coffers of the Bank, and withheld from circulation, but abundance of the 'small change' of ordinary life. Thus we require a sufficiency of *copper* coinage for all our *penny* affairs; a sufficiency of *silver* money for wages and shop-keeping matters; and a sufficiency of *gold* for the general payment of all sums below five pounds. Beyond this, there is a limit to our metallic currency. Neither gold nor silver are in sufficient abundance to represent the more extensive transactions of commerce. Hence the greatest difficulty arises in attempting to make twenty millions of gold do the business of one hundred millions, and be the representative of six thousand millions of national property. The myriads of private bills, which are nothing more than a necessary evil, and the thousands of millions that are yearly passing through our clearing houses, show the utter absurdity of the attempt. Hence the necessity of the speedy abolition of that law (of 1844), which would limit the mighty enterprise and industry of this great empire to a mere handful of gold, and thus, by artificially raising the value of money, cut down to a degrading minimum the chief productions of our native industry.

In a very scarce work, published by Sir James Graham in 1826, entitled 'Corn and Currency,' the principles of supply and demand, as regards money and commodities, are so clearly stated, and so forcibly illustrate the evils of either an overcharged or restricted currency, that we shall close this article with a few short extracts, which fully bear upon this complicated question.

'The value of money,' says Sir James, 'is in the inverse ratio of its quantity,—the supply of commodities remaining the same. Increase the quantity of money, prices rise. Decrease the quantity of money, prices fall. On the other hand, the quantity of money remaining the same, — increase the quantity of commodities, prices fall. Decrease the quantity of commodities prices rise. Thus a decrease of the quantity of money produces the same effect on the price of a commodity as an increase of the quantity of the commodity itself.' Again, 'A contraction of the issues of the Bank of England produces always a proportionate diminution of country bank paper, and a reduction of prices far greater than commensurate with the decrease of the issues of the Bank of England. In periods of excess the issues of the country bankers have greatly exceeded the rate of increase by the Bank of England; and, in periods of contraction, the diminution has been more violent and unlimited. Thus steady prices are impossible, because, without a check on excess, it is the interest of the issuers of paper to push their profits to the utmost verge, and to increase the circulation until the exchanges actually turn; when the Bank of England, in self-defence, contracts its currency, and ultimately forces a contraction of the country paper also; and then commences a rapid and ruinous fall of price, succeeded, in its turn, by a recurring rise. The country is thus exposed to perpetual oscillation between hollow prosperity and real calamity, whereby uncertainty is introduced into the value of all property, and a spirit of gambling and of fraudulent speculation into the ordinary transactions of domestic life.'

In alluding to the Bank Restriction Act of 1819, and speaking of its dire effects from that period till 1822, Sir James Graham remarks that 'Amidst the ruin of the farmer and the manufacturer, the distress of landlords, and the insurrection of a populace without bread and without employment, one class flourished, and was triumphant; the annuitant and the tax-eater rejoiced in the increased value of money, in the sacrifice of productive industry to unproductive wealth; in the victory of the drones over the bees.'

In adverting to the period of 1824, and the great panic of 1825, Sir James Graham clearly demonstrates the effects of over-issue, and the great evils of sudden contraction, as experienced in the years 1847 and 1857.

'The extension of circulation had produced its usual effect of an extension of credit abroad, and of an increased foreign demand for our manufactures. But in August, 1824, the foreign exchanges became unfavourable, and continued so throughout the year 1825. The demand for gold at the Bank of England for exportation was considerable; and on the 5th of January, 1825, gold, to the amount of 4,417,092*l.*, had been exported. In April, the Directors became alarmed; and by a sale of exchequer bills, in the course of three months, to the amount of 670,000*l.*, withdrew from circulation three and a half per cent. of their issues. Money became scarce; the exchanges improved, but credit failed. The country bankers, deprived of accommodation in London, greatly contracted their issues; or, from inability to meet their engagements, became insolvent. Confidence was everywhere destroyed; one-eighth of the English country banks were ruined, and six of the London banks stopped payment. Terror prevailed; credit was at an end; a contraction of the entire currency, ten times more sudden than its extension, was the consequence. Its increase had been progressive for two years; its annihilation was the work of a few weeks.'

CURRENTS OF THE ATMOSPHERE. There are various causes which contribute to dis-

turb the general equilibrium of the atmosphere, and promote those different currents or streams of air to which the surface of the earth is continually exposed. These currents vary in intensity according to circumstances; but the variations of temperature in the surrounding atmosphere may be considered as the most important agent. Thus, (to adopt a simple illustration,) we shall find, in every room, where there is an artificially warm temperature, that if we place a lighted candle to the orifice of the door, the external atmosphere, being colder than that of the warm room, will rush through the orifice, and cause a strong draft. This illustrates the universal law of nature, by which a cold or condensed atmosphere, on any part of the earth's surface, will rush to that portion of the earth where the atmosphere is at a warm temperature, and consequently more rarefied. Air, like every other fluid, has a tendency to find its level, or to force that equilibrium which any variation of temperature had temporarily destroyed. The land and sea breezes, which occur in all the islands of the torrid climes, afford striking illustrations of this principle. The air over the land being more heated than that over the water, the current of air, during the hottest part of the day, sets in from every direction towards the centre of the island. But after sunset the heat is radiated from the land, by which the circumambient air is gradually cooled; when the wind or current of air becomes reversed, and blows from the land towards the sea, the atmosphere of which is warmer than that of the land. There are, however, some atmospheric phenomena, which cannot always be so easily accounted for on this simple principle. The atmosphere in the polar regions being colder and heavier than that in the tropics, will always have a tendency to flow towards the equator, and to displace the lighter air in those heated regions; while the equatorial air so displaced, from being lighter, will naturally ascend, and flow back again over the colder air north and south towards the poles,—the excesses of cold and heat having a tendency at all times to preserve an equilibrium. The currents of air will thus be perpetual; for the heat of the equator and the cold of the poles being constant, the same tendency to change will always exist; and thus the currents will likewise be constant; although perpetual deviations will be taking place, owing chiefly to the diurnal rotation of the earth. If the earth were in a state of rest, and free from irregularity, the currents of air near its surface would, in the northern hemisphere, be always from the north, and in the southern hemisphere always due south. But the earth being in a constant state of motion, the aerial currents are deflected towards the east; and this gives rise to a great variety of currents upon the earth's surface, which, with the northern and southern currents, conspire to produce the phenomena of trade winds. It is to these atmospheric currents, and the great changes of temperature thereon resulting, that the fluctuations of the barometer, which indicate the density or rarefaction of the air, may, with tolerable certainty, be traced. Although the same causes are continually operating in different forms and degrees, so as to produce all that infinite variety of winds which we observe in nature, still they are so numerous and diversified as to baffle all our endeavours to reduce them to any certain rules.

It would be natural to suppose that the tropics would always be exposed to the cold breezes of the polar regions, yet it is not so in reality; for within thirty degrees of the equator regular and constant winds are blowing, those in the southern hemisphere from the south-east, and those in the northern from the north-east. [TRADE WINDS, and MONSOONS.] Although the varieties of temperature may thus be the primary cause of atmospheric currents, still meteorologists have been long conscious that there are many phenomena connected with the subject which cannot be satisfactorily explained by physical science. As we have already stated, it is not always easy to determine, with any degree of accuracy, the causes which disturb the equilibrium of the vast aerial ocean. We are not, however, unacquainted with their operations and effects; and the observations of modern science have done much towards their elucidation. The following table, which is the result of repeated observations, will illustrate the state of the atmosphere, according to the gentleness or velocity with which the currents of air are travelling from one mile to one hundred :—

Miles per Hour.	State of the Atmosphere.
1	Current of air scarcely perceptible.
2, 3	Just perceptible.
4, 5	Gentle wind.
10, 15	Brisk wind.
20, 25	Very brisk wind.
30, 35	High wind.
40, 45	Very high wind.
50	Stormy.
60	Heavy storm.
80	Hurricane.
100	Tempest, sweeping away trees and buildings before it.

Thus the currents of the atmosphere display an endless variety, from the gentle breeze, which scarcely stirs the leaves, to the raging tempest, which outstrips the swiftest locomotive in speed, tears up the forest trees, and destroys the habitations of man. The tempests which thus ravage the Antilles and the Mascarenes are among the most violent and destructive of natural phenomena. One of these, which took place in the island of Jamaica, has been vividly described by Mr. Stewart. After noticing the terrible portents which announced the approaching storm, he says—'In a few hours the hurricane reaches its *acme* of violence,—when all the winds of heaven, and from every point of the compass, winged with

destruction, seem let loose from their caverns. The largest trees are thrown prostrate, or shattered and stripped of their foliage; the provision grounds are laid waste; the sugar-canes levelled to the earth, and in the more exposed situations torn up by the roots, and wafted about like chaff. Many of the dwellings are blown down or unroofed, and their inhabitants too often either buried in the ruins, or driven forth to perish unsheltered. Nothing can be more appalling than the wild howling and threatening violence of a hurricane during the night, when the vivid and quickly-succeeding gleams of lightning, darting across the heavens, make "darkness visible," and heighten the horror of the scene.'

(*Philosophical Transactions;* Smeaton; Higgins; Milner's *Gallery of Nature;* Prout.)

CURULE CHAIR, a chair of state, frequently mentioned by the Roman writers, in which the superior magistrates, the consuls, prætors, ædiles, and censors, had a right to sit and be carried. Hence they were called *curule* magistrates. It was also used by generals in triumph, and by those senators who had passed through the above offices, when they were carried to the Senate house.

CUSTOMS' DUTIES (v. 167-9). Some important changes have taken place in the management and receipts of these duties. In 1857 the Board of Commissioners issued a report, giving a history of their increasing prosperity, and stating the vast improvement attending their collection. From this report, it appears that in 1297 the customs yielded only 8,000*l.*; in 1650, 500,000*l.*; a century later 2,000,000*l.*; at the commencement of the present century, 11,000,000*l.*; and in 1856 they produced the enormous revenue of 24,206,844*l.*, notwithstanding reductions to upwards of ten millions. But in 1857, owing to the monetary crisis, and considerable reductions of duty on tea, coffee, sugar, &c., the total receipts were only 22,956,971*l.* Moreover, the cost of collection has been reduced from 15 to 6 per cent. While in 1821 it required 7,259 officers, at salaries of 770,000*l.*, to collect 30,000,000*l.* in official value, 5,539 officers now collect 117,000,000*l.* worth, at a charge of 687,000*l.*

CY'ANIDE, is a compound of cyanic acid, with a salifiable base, of which there are various combinations; as *Cyanide of Ammonia*, which is formed in bright crystal plates, and highly poisonous;—*Cyanide of Cobalt*, a whitish-brown precipitate;—*Cyanide of Iron*, a gray insoluble powder;—and *Cyanide of Kakodyle*, a combination of cyanogen with kakodyle. Independently of the fetid odour and malignant properties of kakodyle, this last compound possesses a deadly quality peculiar to itself. When exposed to the atmosphere, it ascends in the form of vapour, which by the contact of air and moisture is immediately decomposed. 'The metal arsenic, with the oxygen of the moisture,' says Dr. Johnston, 'forms fumes of poisonous white arsenic, while at the same time the cyanogen unites with the hydrogen to form prussic acid. Thus through the air are diffused, at the same instant, vapours of the two most deadly poisons with which we are acquainted. Mercaptan and oil of garlic expel us by their insufferable stench. The kakodyles and their cyanides arrest our flight by almost as suddenly depriving us of life.'—There is also the *Cyanide of Palladium*, of *Silver*, and of *Zinc;* the last being a brilliant white tasteless powder. The *Bicyanide of Mercury* is crystallized in colourless transparent masses, in regular four or six-sided prisms, and highly poisonous. The formula of the *Percyanide of Gold* is $AuCy^3 = 278{\cdot}17$.

CYAN'OGEN (v. 174). To the presence of Cyanogen, the difference of properties possessed by the horse-radish are to be ascribed. The smell and taste of the oil it yields are very strong and pungent; but it has little of the fetid character which distinguishes those of assafœtida and garlic.

CYCLE OF INDICTION, a term mentioned in chronological calculations, as denoting a period of fifteen years, and originally serving, it is said, to indicate the year in which a certain tribute was paid to the Roman Republic. It then received the name of the *Roman Indiction;* but afterwards, when it was employed by the Court of Rome in its decrees and bulls, it received the appellation of *Pontifical Indiction*, and its use by the see of Rome is attributed to the Council of Nice, on the following grounds: 'In the year 312 (says Ozanam, in his 'Philosophical Recreations,') Constantine issued an edict, by which he authorised the exercise of the Christian religion throughout the whole empire. Some years after, the Council of Nice was assembled, which in 328 condemned the heresy of Arius. In the space therefore of fifteen years, Christianity triumphed over persecution and heresy; and on that account it was considered as a memorable period. To preserve the remembrance of it, the Cycle of Indiction was established; the commencement of which was fixed at the 1st of January, A.D. 313, to make it begin with the solar year; though the epoch of this Cycle, according to the institution of Constantine, had been fixed at the month of September, A.D. 312, the date of his edict in favour of the Christians. It was the Emperor Justinian, however, who first ordered that the method of computing by the Indiction should be introduced into the public Acts.'

Whatever may have been its origin, it is certain that the first year of the Indiction was the year 313 of the Christian era. The year 312 therefore must have corresponded to 15 of the Indiction, had this method of computation been in use; and if 312 be divided by 15, the remainder will be 12, which shows that the 12th year of the Christian era was the 15th of the Indictions; consequently this cycle must have begun three years before the birth of Christ; or, in other words, the first year of the Christian era corresponded to the fourth of the Indiction; and hence, to find the number of the Roman Indiction, which corresponds to any given year, we have to add three to that year, and divide the sum by 15; the remainder will indicate the current year of the Indiction. Let it be required, for example, to find the Indiction of the year

1858; if three be added, we shall have 1861; and if this sum be divided by 15, the remainder will be 1; hence the Indiction for 1858 is 1.

CYNIPSIDES (Lat. *cynips* the dog-fly), a tribe of Hymenopterous insects, the type of which is the *Cynips*, or Gall-fly. Their bodies and limbs are usually ornamented with shining metallic colours. In their larva state they are parasitical; and some of them, like the ants, are without wings.

CYNOSAR'GES, a celebrated academy in the suburb of Athens, where Antisthenes taught the Cynic philosophy, and where the gymnasium of the Greeks was established. Hercules was considered as the patron deity of the place, and he had a magnificent temple erected in his honour. There were also several other temples dedicated to Hebe, Alcmene, and Iolas, all of which bore some relation to Hercules. But the most remarkable characteristic of the place was the celebrated gymnasium, in which all those that were but of Athenian descent by one of their parents, were allowed to perform their exercises. There was also a Court of Judicature held here, where cases of suspected legitimacy were heard, and where investigations were entered into concerning those persons who were suspected of having falsely inserted their names among the true-born Athenians.

CYPHONIS'MUS, among the ancient Greeks, a sort of punishment, which consisted in tying the criminal to a stake, rubbing him with honey, and leaving him exposed to the sun to be tormented with insects.

CYPRESS (v. 159) (Gr. Κύπρος the Isle of Cyprus, and Lat. *cupressus* a cypress tree) is one of those magnificent productions of the vegetable creation, which, at all times, has inspired mankind with feelings of veneration, especially in the Eastern climes, where many of them, in all probability, had their origin in primeval ages, and have witnessed the rise and fall of many ancient empires.

The mountainous regions of Asia and Europe are, perhaps, the most natural habitats of these trees, where they are found of great size and antiquity, and are held in the deepest veneration by the natives. Moreover they have formed in all ages, and continue to form, the principal decorations of the palaces and gardens of royalty. In the gardens of the Alhambra Palace in Spain are still to be seen cypresses, under the shade of which reposed the Moorish kings and queens of Granada. There is one tree in particular, said to be nearly 1000 years old, which is pointed out as the one beneath whose shade the Reina Sultana was surprised with her favourite Abencerrage; at least such are the traditions of poetry and romance.

From their general funereal aspect, and perennial duration, they have been usually selected as memorials of the dead, and still constitute the principal ornaments of the cemeteries of eastern Europe, especially in Greece and Turkey. Virgil calls the cypress the 'atra cupressus;' and in Horace we have the 'cupressos funebres.' In Italy, where these poets sang their immortal strains, the 'sky-cleaving cypress' forms a striking feature of Italian scenery; and with the cypress the classic painters of Italy generally adorn their landscapes. The villas of her princes and nobles are also ornamented with magnificent rows of the cypress. The 'theatre of cypresses,' as it is called, forms one of the most pleasing examples of the picturesque in the whole country.

CYPRESS TREES OF ITALY.

On the continent of America, also, there are cypress trees of an immense age. By counting the concentric rings observed in the wood, it appears that four or five hundred years is a common age. But there are specimens found in Mexico of some thousand years' growth. Near Santa Maria del Tula, in the province of Oaxaca, there is a gigantic trunk of the cypress, whose circumference, at the dilated base, is no less than 200 feet. Counting the rings in the usual way, and calculating the average growth of each for a year, the age of this enormous tree is found to be 3512 years.

CYRENA'ICI, among the Greeks, a sect of philosophers, of which Aristippa of Cyrenaica, in Africa, was the founder. Like the Epicureans, they placed their greatest good in pleasure. (Laertius.)

CYRILLA'CEÆ, an order of Hypogonous Exogens, natives of North America, of which *Cyrilla*, so called in honour of Professor Cyrilli of Naples, is the type. They consist of shrubs, with evergreen leaves and regular symmetrical flowers. Their fruit is a drupe.

CYTHERE'A, a genus of Mollusca, of the subfamily Venerinæ, in which the shell is bivalve and glossy.

D.

DACTYLE'THRA (Gr. δάκτυλος a finger, and ἴθυρα a hair), a genus of amphibious reptiles, of the order *Anoura*, in which the three internal toes are enveloped in a black horny substance, of a conical shape.

DACTYLOCE'RA (Gr. δάκτυλος, and κῆρα a horn), a genus of Malocostracan insects, of the order *Amphipoda*.

DACTYLOP'ORA (Gr. δάκτυλος, and πόρος a pore), a genus of corals, of the subclass *Polyparia membranacea*.

DÆ'DALA, festivals among the classical ancients, which were celebrated with great solemnity once in sixty years. They were held chiefly in Platææ, and other cities of Bœotia. On these occasions an altar of square pieces of timber was built upon Mount Cithæron, whither a statue, dressed out like a woman, was preceded by a female, attired like a bridemaid, and followed by a long train of Bœotians in solemn procession. On their arrival, each city, and every man of fortune, offered a bull to Jupiter; and an ox or heifer to Juno; the poorer people provided sheep. These, with various combustibles, wine, and incense, were laid upon the altar; and twelve statues, called *Dædala*, were thrown into the same common heap; then the whole was set on fire, and not extinguished till the fabric, of which the altar made a part, was totally consumed.

Another festival, of the same name, but of a subordinate character, was observed by the Platæans at the grove of Alalcomenos. Here, when assembled, they exposed to the air pieces of boiled flesh; and observing on what trees the crows alighted that came to feed upon them, they cut them down, and formed them into statues called Dædala, in honour of Dædalus.

DAGON (Heb. *dag* a fish), in Eastern mythology, one of the principal divinities of the ancient Syrians and Phœnicians. He is usually represented as half-man and half fish, and many conjectures have been given as to his mythological origin. The fact of the early Phœnicians being a great sea-faring people may throw some light on the subject; for Dagon does not appear to have been the only fish-deity of that maritime people. We are told by Diodorus that at Askelon the goddess Derceto, or Atergatis, was worshipped under the figure of a woman, with the lower parts of a fish. The Babylonians had an ancient tradition which may throw some light on the mystic origin of the fish-divinities of Syria. In Berosus there is an ancient fable, which mentions that Oannes, who was half man and half fish, came to Babylon, and taught the rude inhabitants the use of letters, arts, religion, agriculture, law, &c.; and afterwards returned to the sea. After long intervals of time other similar beings made their appearance, and gave them the same valuable instruction as Oannes had done; and that the last was *Odakon*, or *Odagon* (Gr. Ὁ Δαγὼν), which, in all probability, is the Dagon mentioned in Scripture by Jewish historians, who gave it the name of the *fish* deity, as the word implies. (Berosus; Calmet; Craig.)

DAGUERRE'OTYPE (from *M. Daguerre*, the name of the inventor), a process by which portraits, views, &c. can be taken with the most perfect accuracy. The semblance of the object is delineated by means of reflection from the image itself, on a polished plate of copper coated over with silver, which, after being washed with a solution of nitric acid, is exposed to the action of iodine,—the plate itself being fixed in a kind of camera obscura. [PHOTOGRAPHY, ix. 535.]

DALA'TIAS, a genus of the *Squalidæ*, or typical sharks, distinguished by having no spiracles; with two dorsal fins; a large vertical, lunate tail; the snout with an angulated base; and the teeth acute and unequal. [SQUALIDÆ, xi. 336.]

DALBER'GIEÆ (from *Dalbergia*, one of the genera, so named in honour of *Dalberg*, the Swedish botanist), a tribe of leguminous plants, consisting of climbing shrubs and trees, in which the corolla is perigynous and papilionaceous; the stamens variously connected; legumes dehiscent, and one or two-seeded; the cotyledons thick, with the radicles bent back upon their edges.

DALIAN PROBLEM, the duplication of the cube, or finding the side of a cube which shall be double that of another one of a smaller size. The name originated from the story that the Dalians were commanded by the Oracle, in order to avert a pestilence, to produce a cubical altar double the solid contents of the one then existing. The *Dalians applied to the Athenian philosophers*; but its solution eluded all their attempts.

DALMAT'ICA, in the Roman Catholic Church, a long white robe with sleeves, worn by deacons over the alb and stole. In the Middle ages a similar robe was worn by kings at their coronations and other public solemnities. The Dalmatica was so called from having been originally worn in Dalmatia, and imported into Rome by the Emperor Commodus.

DAL'OPHIS, in zoology, a genus of fishes belonging to the *Muræniдæ*, or Eel family, and so named from its serpent-like shape. It has no pectoral fins, and the dorsal and anal fins terminate before reaching the end of the tail.

DALTON, DR. JOHN, F.R.S., was born at Eaglesfield, Cumberland, in 1766; and in 1781 he became a mathematical teacher in Kendal, from whence he contributed largely, upon mathematical, philosophical, and general subjects, to the two annual works, called the 'Gentleman's' and 'Lady's Diary.' In 1788 he commenced his meteorological observations, which he continued throughout his life. In 1793 he published an octavo volume of 'Meteorological Observations and Essays.'. In the same year he was appointed Professor of Mathematics and Natural Philosophy, in the New College, Mosley Street, Manchester, and continued to hold his office until the College was finally removed to York. In 1808 he published 'A New System of Chemical Philosophy,' and a second part in 1810. He also frequently contributed to 'Nicholson's Journal,' the 'Annals of Philosophy,' and the 'Philosophical Magazine,' as well as to the 'Memoirs of the Literary and Philosophical Society of Manchester,' of which for half a century he was an active member. In 1826 he was presented with a gold medal, by the Royal Society, for his scientific discoveries; and in 1833 the sum of 2000*l.* was raised by his friends and townsmen, for the erection of a statue to perpetuate his remembrance. He died in 1844.

DAM'ALIS, in geology, a genus of quadrupeds, of the order *Ruminantia*, which are considered as intervening between the sheep and the oxen. They are large, and the first vertebra of the back is usually elevated above the rest of the spine.

DAMASKING, or DAMASKEENING, the process of ornamenting steel, iron, &c., by making incisions in the metal, and filling them up with gold and silver wire. Locks of pistols, sword-blades, and other ornamental iron ware are thus beautified.

DA'MIANISTS, an early Christian sect of the sixth and seventh centuries, so called from Damian, Bishop of Alexandria. They disowned any distinction of Persons in the Godhead, and professed one single nature, incapable of any change.

DAMMA'RA, in botany, a genus of plants of the order *Pinaceæ*, some of which grow to a vast height. One of the species, the Cowdie-pine of New Zealand, grows more than 100 feet high, and, being perfectly straight, is well adapted for the masts of ships.

DANÆA'CEÆ, in botany, an order of fern-like tropical plants, some of which have the appearance of trees. They have the characteristics of dorsiferous ferns, but distinguished by ringless dorsal spore cases, which are united in masses.

DAN'AIS, in botany, a genus of plants, of the order *Cinchonaceæ*, which are natives of the Mauritius. They consist of climbing shrubs, with orange-coloured blossoms, yielding a fragrant perfume.

DANCING, an art which has not only been practised in all ages as an amusement, but has been associated with religious festivals of various nations, especially the Hebrews, Greeks, and Romans. Thus, in scriptural history, we learn that David danced before the ark in honour of God; and at Rome the Salii danced through the streets in honour of Mars. Among the Greeks the art was cultivated with great attention. Homer speaks of the gods as sometimes daneing; and Plutarch, in lamenting that the art of dancing no longer retained the merit which rendered it so estimable to the illustrious men of antiquity, says that it was corrupted by a vicious kind of poetry and a soft effeminate music, which had taken place of that ancient poetry and music which had something majestic, and even heavenly and religious in them.

The ancients divided dancing into three kinds, the *cubistic*, the *sphæristic*, and the *orchestic*. The cubistic was performed with certain wrestlings and contortions of the body; the sphæristic with a sort of ball or bowl play; the orchestic was dancing properly so called. We read of the Pyrrhic dance, invented by Pyrrhus, and performed in armour, something like the morrice dance. Mention is also made of dances, called *cordax*, or *cordacismus*, *syncinnis*, and *emmælia*, which took their names from satyrs. Of the classical dances the chief were: 1. The *Bacchic*, performed by satyrs and bacchants. In numerous ancient monuments are the *thyases*, or dances of the Bacchants. In some they appear with one foot in the air, tossing the head up to the sky; their hair dishevelled and floating upon their shoulders, holding in one hand a thyrsus, in the other a small figure of Bacchus. In others, the body, half naked, is in the most violent contortion; and in one hand they hold a sword, in the other a human head, that of Orpheus just cut off. 2. The *rustic*, which Pan, the presumed inventor, ordered to be made in the midst of a wood. Young men and women danced with oaken crowns, and garlands of flowers hanging from the left shoulder, and fastened to the right side. 3. The *convivial*, consisting of a ball after feasting, of various dances to different instruments. 4. The *dance of Hymen*, a modest and serious dance of boys and girls, crowned with flowers. 5. The *nuptial dance*. 6. The *theatrical dance*, pantomimical, serious, or gay; in which the old chorus and principal characters were continually dancing the whole time upon the stage. There were also the *Salian*, the *Pyrrhic*, and numerous others.

The most popular dances, among our mediæval ancestors, were the *brawl*, *chacone*, *coranto*, *country dance* (contra-dance), *French-more*, *galliards*, *gavot*, *hornpipe*, *jig*, *lavoltoes*, *minuet*, *paspy*, *passamezzo*, *pavan*, *laraband*, *waltz*, &c. (Nuttall's *Class. Dict.*)

DANDRIF, in pathology, a disease which exhibits itself in scale-like patches on the skin, scientifically known as Pityriasis. There are different kinds of this disease specified by medical writers; as *Pityriasis capitis*, dandrif of the head; *P. versicolor*, variegated dandrif; *P. nigra*, black dandrif; and *P. rubra*, red dandrif.

DANEWORT, a fetid kind of herbaceous plant, the *Sambucus ebulus*, or Dwarf-elder; so called because it was supposed, by our Anglo-

Saxon ancestors, to have sprung from the blood of their inveterate foes, the Danes.

DANIELL, THOMAS, R.A., F.R.S., F.S.A., and F.R.A.S., the distinguished artist, was born in 1749, and served his time to a herald painter. At an early period of his life he became a student of the Royal Academy, and devoted himself to the study of landscape, in which he made rapid progress. At the age of 35 he took a voyage to India, accompanied by his nephew, the late William Daniell, R.A. They were absent from England about ten years, pursuing their profession with profit and advantage in the East. At Calcutta they published a series of views of that city; and on their revisiting England, commenced the folio work, entitled 'Oriental Scenery,' in six volumes. After the completion of the large Indian work, he appeared before the public only in his productions annually exhibited at Somerset House; but to these he had not contributed for many years prior to his death, which took place in 1840.

DAPHNE, in mythology, one of the nymphs of Diana, who, in her flight from Apollo, to escape his embraces, was changed into a laurel, which, from the fable, was held as sacred to Apollo, and regarded as the symbol of honour and fame.

DAPH'NIA, in entomology, a genus of Entomostracans, the water-flea. The *Daphnia pulex* is an interesting microscopic object. The swarms which abound in stagnant water often impart to it a redness of colour.

DAPHNIPHYL'LUM (Gr. δάφνη a laurel, and φύλλον a leaf), a Javanese tree, of the order *Rhamnaceæ*. It has laurel-like leaves and simple axillary racemes of flowers.

DAP'IFER, a name formerly given to the grand master of royal mansions; and also to the domestic officer in the mansions of the feudal lords, similar to our modern Steward of the household. In more recent times the name was applied to any confidential servant, as the chief steward, or head bailiff of a manor or honour. (Cowell.)

D'ARLINCOURT, VICTOR, VICOMPTE, the distinguished French writer, began his literary career in 1810, by the publication of an allegorical poem, called 'Une Matinée de Charlemagne.' He soon afterwards entered on the general arena of literature somewhat in the inflated style of M. de Chateaubriand, and brought out a series of floridly-written romances; among others, the 'Solitaire,' 'L'Estranger,' 'Le Renegat,' 'Ipsoboé,' and 'L'Etoile Polaire.' He also wrote a tragedy, called 'Le Siege de Paris,' which was played at the Théâtre de Paris, but not with much success. The most favourably received of his productions was the 'Solitaire,' which was translated into English and other languages; and this, perhaps, was chiefly owing to the patronage it received from the royal family of the Bourbons, of whom he was an ardent supporter. It was read in every chateau, and acted, in a dramatic form, on every stage. Its success, indeed, was the means partially of redeeming the fallen fortunes of his house. During his travels in England he wrote a work on 'The Three Kingdoms,' which was read more as a curiosity than for its literary merits. He died in 1856.

DARNEL (Lolium, viii. 100), a narcotic grass, which grows plentifully in our corn-fields, and often becomes impregnated with our bread and fermented liquors, by its being cut down, and thrashed with the corn where it grows, of which the farmers ought to be remarkably careful. The annexed representation is an ear of the bearded darnel, of the natural size.

BEARDED DARNEL.

When the seeds are malted along with the barley, which sometimes, from negligence, is apt to take place, they impart their intoxicating properties to the beer, and often render it dangerously so. A similar narcotic effect takes place when the seeds happen to be ground with the wheat, and made into bread. Dr. Johnston relates an instance which occurred at Roscrea in Ireland, in 1853, where not less than thirty persons were poisoned by eating darnel flour in their oat-meal bread. Their frames were violently convulsed, and exposed to *delirium tremens*, paralysis, and other affections; and it was only by the application of strong emetics and stimulants that the patients were recovered. The narcotic principle in these seeds has not yet been discovered.

DASYGAS'TRÆ (Gr. δασὺς and γαστὴρ, a hairy belly), a subdivision of the bee family, which have a hirsute venter, by which they carry their provisions, instead of by the legs, as the other bees do.

DASYOR'NIS (Gr. δασὺς and ὄρνις, a hairy bird), a genus of birds belonging to the thrush family.

DAS'YPUS (Gr. δασὺς and πούς, a hairy foot), a genus of ant-eaters (the armadillos), of the order *Edentata*. The head is long, and the fore feet furnished with four or five toes, adapted for digging.

DASYU'RUS (Gr. δασὺς and οὐρὰ, hairy-tailed), a genus of Marsupial animals (the brush-tailed opossum). They differ from the true opossum in not having prehensile tails, from which they are unable to pursue their prey among the branches of trees, like other animals of the same kind.

DATIS'CEÆ (*datica*, bastard hemp, one of the genera), an order of Exogens; consisting of herbaceous plants, and of large-sized trees, with apetalous flowers in axillary racemes, the calyx and fruit adherent.

DAT'NIA, a genus of fishes, of the family *Percidæ*, with broad bodies, scaly heads, and the dorsal and anal spines very large.

DAT'OLYTE, a mineral, of a grey-greenish white, of a somewhat vitreous lustre, and an imperfectly conchoidal fracture. It occurs massive, and in crystallized rhombic prisms. It is composed of boracic acid, 24·0; silica, 36·5; lime, 35·6; water, 4·0; specific gravity, 2·9–3·3.

DAUNOU, M. PIERRE CLAUDE FRANÇOIS, Perpetual Secretary of the Academy des Inscriptions et Belles-Lettres of France, Keeper-general of the Archives of the Kingdom, &c., was born at Boulogne in 1761. Few men have been more eminent in the political and literary arena of Europe. In 1787 he first distinguished himself by an essay, 'De l'Influence de Boileau sur la Litérature Française;' and in the following year the Academy of Berlin adjudged a prize to his essay 'On the Origin, Extent, and Limits of Paternal Authority.' After the breaking out of the French revolution he became a conspicuous actor in its busy scenes. In 1792 he was elected a member of the National Convention, and in 1794 became its secretary. He was then elected one of the council of Five Hundred, where he was equally distinguished by his strict integrity, sound information, moderation, and application to business. He was hostile to the revolution of the 18th Brumaire, by which Napoleon overthrew the Directorial government; and he consequently refused to take any share in drawing up the new laws; nor would he accept the post of Councillor of State. In December 1804, he succeeded Camus as archivist of the Legislative body; and in 1807 he was made archivist of the Empire, and a member of the Legion of Honour. At the Restoration he lost his appointments, but became editor of the 'Journal des Savants,' which he continued to conduct, and was a constant contributor until 1838. He was also enrolled in the Academy of Inscriptions, on its re-organization. In 1819 he was appointed to the Professorship of History in the College of France, which he resigned in 1830. On the revolution of that year he was restored to the offices he had lost at the Restoration; and he was subsequently elevated to the dignity of a Peer of France. He succeeded the illustrious Silvestre de Sacyas, Perpetual Secretary of the Académie des Inscriptions et Belles-Lettres; and thereupon resigned the editorship of the 'Journal des Savants.'

M. Daunou was very laborious in his literary labours. He wrote more than sixty articles in the 'Biographie Universelle,' about 150 in the 'Histoire Littéraire,' and 128 in the 'Journal des Savants:' discussing in turn the several subjects of philology, literature, philosophy, morals, archæology, numismatics, chronology, and the whole field of ancient and modern history, not only as relating to France, but to the greater part of Europe. He died in 1840.

DAVID'S DAY, ST., the day held on the 1st of March in honour of St. David, Archbishop of Menevia in Pembrokeshire, now called St. David's. He is supposed to have lived in the sixth century, and died at a very advanced age.

DAVIES, T. S., Professor of Mathematics in the Royal Military Academy at Woolwich, F.R.S., &c., was born in 1794. He was not only distinguished as a mathematician, but he possessed an extensive and varied acquaintance with many branches of literature and science. In the 'Westminster Review' of April 1851, appears a long catalogue of his writings in various publications. His earliest communications were made to the 'Leeds Correspondent' in July 1817, and the 'Gentleman's Diary' for 1819; and he subsequently contributed to the 'Gentleman's' and 'Lady's Diaries,' to 'Clay's Scientific Receptacle,' to the 'Monthly Magazine,' the 'Philosophical Magazine,' and the 'Mechanic's Magazine.' To the third series of the 'Philosophical Magazine' he was a large and valuable contributor. He became a Fellow of the Royal Society in 1831; and he contributed several original and elaborate papers to its Transactions. His larger works were the eleventh edition of Dr. Hutton's 'Course of Mathematics,' 1836–37 (nominally under the editorship of Dr. Gregory); solutions of the principal questions in Dr. Hutton's 'Course of Mathematics;' the twelfth edition of Dr. Hutton's 'Course' in 1841; and a considerable portion of 'The Mathematician,' of which he was joint editor with Dr. Rutherford and Mr. Fenwick. He was elected a Fellow of the Society of Antiquaries, March 19, 1850, and died in 1851.

DAVOUST, MARSHAL LOUIS NICHOLAS, Prince of Eckmuhl, was born at Annoux, in 1770. He was educated at the Ecole Militaire, and studied at Brienne with Napoleon Bonaparte. He first entered the French army in 1785. Soon after the breaking out of the revolutionary war he was raised to the rank of provisional Chef de Brigade, and in 1794 was general of brigade. In these capacities he fought in Belgium, on the Rhone, and the Moselle, and in Egypt. He particularly distinguished himself at the passage of the Rhine, in the attack and capture of the intrenchments of the enemy at Diersheim and Honnau; in the expedition to Upper Egypt with General Desaix; and at the battle of Aboukir, on the 25th of July, 1799. Napoleon Bonaparte discovering his great military talents appointed him a general of division, and gave him the command of the cavalry with the army of Italy in 1800, and in the following year appointed him inspector-general of the French cavalry. When the camp was formed at Bruges in 1803, the command-in-chief was conferred on Davoust. He subsequently received the bâton of a marshal of the empire, and in that exalted capacity commanded the corps d'armée on the Rhine and in Germany, contributing, by his skill and bravery, to the subjugation of Prussia and Austria. In 1808 he was created Duc d'Auerstaedt, and in 1809 was raised to the dignity of Prince d'Eckmuhl. After the campaign in Germany he held command in the grand army, which struggled for French dominion in Spain and Portugal. Upon the restoration of the Bourbons he was deprived of all the appointments he enjoyed; but in August 1817, the privileges and emoluments of a French marshal were restored to him. He died at Paris in 1823. (*Military Cyclopedia.*)

DAVY LAMP (v. 251). In 'Novelties, Inventions,' &c., we have a very interesting account

of this useful discovery, which the scientific mind of Sir H. Davy brought into operation. In coal-mines the huge masses of coal give off carburetted hydrogen gas; this gas combines with the air which enters the mine, and at a certain ratio of mixture the two gases or airs explode when a light reaches them. Thus the coal-miner is never quite safe; he is either liable to be burnt by the fire-damp or gas, if this explodes, or to be suffocated by the choke-damp, which is one of the results of the explosion. Hence the earnest desire to prevent any naked flame from reaching the gas, and hence Sir H. Davy's highly-scientific mode of lighting the miner without perilling his life. If a fine iron wire gauze surround a flame, no flame can pass through the meshes; unignited gas may, but flame cannot. Herein lies the whole principle of the 'safety lamp'; it is a simple oil lamp, with a wire gauze enveloped around the flame. Fire-damp may get into the enclosed space, through the meshes, and may there burn; but the produced flame cannot get out of the space, without which it could not ignite the gas in the mine generally. It is a fearful thing to those who know what has occurred and is likely to occur in mines, to see a faint blue light within the gauze space. This shows that the mine is full of fire-damp, that some has entered the lamp, and that the least failure in soundness or in carefulness will lead to an explosion.

Dr. Clanny has improved upon Davy's lamp, insomuch as to enable it to give a better light, and to act more safely. Mr. Goldsworthy Gurney, too, has recently directed his attention to the miner's lamp,—not so much, however, with a view to its safety as to enable it to yield more light to the miners. He states that three-fourths of the light of an ordinary Davy lamp is lost by the use of dull iron wire; but that if the wire were plated and polished the loss would be only one-eighth.

DEBLAI, in fortification, the hollow space or excavation formed by removing earth for the construction of parapets. Thus the ditch or fosse, whence the earth has been taken, represents the déblai, while the earth itself, so removed, constitutes the remblai. (*Military Cyclopedia.*)

DECAN'DRIA. [Botany, *Supplt.*]

DECAGYN'IA (Gr. δέκα ten, and γυνὴ a female), the name of an order in the Linnæan system of botany, including those plants which have ten pistils or female organs of fructification.

DECIMAL SYSTEM OF MONEY, is that portion of arithmetical science which divides and sub-divides the money of a State into tenths, or into decimal, centesimal, or millesimal parts. Thus in France the *franc* is divided into 100 centimes; and in the United States the dollar is sub-divided into 100 cents. The same decimal sub-division of money exists in various European States; and in our own country the adoption of the decimal system has long been under the consideration of the government and the legislature, of which the issue of the florin, or tenth of a pound, may be looked upon as the forerunner.

The advantages of a decimal or centesimal system of money are too self-evident to admit of dispute; the sovereign, or pound sterling, is so complicated and irregular in its various divisions and sub-divisons, as not only to puzzle foreigners, but to require a long and tedious course of education to acquire a facility in money calculations. Although the ordinary process may appear very easy to bankers, merchants, and clerks, who have devoted their whole lives to the practice of figures, still money calculations are usually a task of great labour to the thousands of retail traders and business-men, who constitute the vast majority of the community.

So important has the consideration and adoption of the decimal system of money become, that the House of Commons lately passed a resolution approving of the system, and the government soon afterwards resolved on the appointment of a commission, to inquire into the expediency of a new decimal coinage. Now in the establishment of the decimal system of money, as applied to general accounts, there can be no difficulty, and there need be no delay; but to wait until the issuing of a new coinage, is to wait till the arrival of the Greek Calends; for the total withdrawal of our silver and copper coins, and the sudden re-issue of new ones, is of too formidable a character to be carried into full operation in any reasonable period; and even if it were practicable, the perplexities of the old and new coinages being in circulation at the same time, and each possessing different fractional values, would involve all the petty transactions of trade in eternal confusion. But all these difficulties can at once be obviated by adapting the existing coinage to the decimary system of money, and declaring, by public enactment, that a pound sterling shall henceforth be equivalent to 1000 farthings (or *mils*), instead of 960, as at present; by which a florin would centesimally correspond with 100 farthings, a shilling with 50, and sixpence with 25. We should thus render the issue of a new copper coinage (as well as of the silver one) unnecessary, with the exception, perhaps, of a ten-farthing silver piece, to represent the tenth of the florin, and the centesimal part of a pound.

Now in this proposal to reduce the *extrinsic* value of the copper coinage, there could be no injustice, because the price of the raw material bears no comparison with that of the coinage; while the *intrinsic* value of our gold and silver coins is nearly equal to their current worth. In fact it is simply an increase of four per cent. on the value of the silver and gold currency, as compared with the copper; and yet, according to the system of calculation now propounded, no fractional reduction in the value of odd coppers below sixpence would ever take place. By thus making the pound sterling correspond with 1000 farthings, the silver and copper coinages can be readily reduced to the millesimal parts of a pound, or the centesimal parts of a florin—the present farthing (or *mil*), representing the lowest fractional unity of money. But as the additional mil would only be taken into calculation when the amount reached sixpence (which would represent 25 mils), the present half-penny, penny, three-penny and four-

penny pieces would continue to retain their existing value.

Yet, after all, the great difficulty is to render any system of decimation, however simple to the initiated, readily intelligible to the masses of the community; and before any settled plan is officially declared, the government must publish a table of money equivalents, for the general use of schools and the trading community; and thus endeavour to diffuse through all classes a clear knowledge of decimal calculations, which might, in the end, be advantageously applied to weights and measures. By way of sample, we present the following enumeration of the equivalent decimal or millesimal values of every existing coin in current use—the one-and-sixpence being included, in order to make the centesimality of the florin or the millesimality of the pound complete.

£	s.	d.		florins. mils or farthings.
1	0	0	equiv. to	10 ·00
0	10	0	=	5 ·00
0	5	0	=	2 ·50
0	2	6	=	1 ·25
0	2	0	=	1 ·00
0	1	6	=	·75
0	1	0	=	·50
0	0	6	=	·25
0	0	4	=	·16
0	0	3	=	·12
0	0	1	=	·04
0	0	0½	=	·02
0	0	0¼	=	·01
2	3	2¾	=	£2 1 ·60

In this addition we find one mil less, on account of the fractional values not having been added to the *4d.* and *3d.*; the *4d.* according to decimal calculation, being ·16666; *3d.* ·125; *1d.* ·04166; ¼*d.* ·020833; and ¼*d.* ·010416; which are altogether of too complex a character for general use. If, however, we add one mil either to the *3d.* or *4d.*, the two calculations will precisely correspond.

By the aid of a simple table, similar to the above, in which only two minor denominations of money, florins and mils, need be adopted, every one of our current coins could, if necessary, be momentarily reduced to the florin or its centesimal parts, without any knowledge of abstruse decimal calculations; and this simple formula could be committed to memory in one-tenth of the time usually occupied by the common pence-table of the schools. In truth, the whole system would require nothing more than the knowledge of multiplying and dividing by *four*. Thus, if we multiply the odd pence of the shilling by *four*, we at once gain the centesimal of the florin, or the millesimal of the pound—adding *one*, of course, for each sixpence. At the same time it may be borne in mind, that the fourth, half, and three-fourths of a florin (that is *6d.*, *1s.*, and *1s. 6d.*) are always expressed by ·25, ·50, and ·75, which form the fourth, half, and three-fourths of 100, agreeably to the common decimal rules. Thus if we wish to write *1l. 16s. 8d.* in a decimal way, we put down £1·8·33, because eight florins are equal to sixteen shillings, and eight-

pence multiplied by four, and one added for the sixpence, are equivalent to 33 farthings, or mils. The least practice, however, would soon render the system of converting one into the other a mere matter of every-day facility.

But in book-keeping, and moneys of account, this decimal system would afford immense facilities, of which we shall adduce a few practical illustrations.

ADDITION.

£	s.	d.		£ florins. mils.
1	12	0	equiv. to	1 6 ·00
1	12	6	=	1 6 ·25
1	13	0	=	1 6 ·50
1	13	6	=	1 6 ·75
1	14	3½	=	1 7 ·14
1	14	9½	=	1 7 ·39 = ·40
1	14	11	=	1 7 ·45 = ·46
11	15	0	=	£11 7 ·48
Deficiency in the fractional values of the odd pence				·02 *
				£11 7 50

* It may be here explained, that if we choose to add the half farthing (or ·5) to the odd penny, from *3d* to *6d.*, we shall arrive at fractional exactitude; but this would scarce be worth consideration.

MULTIPLICATION.

Multiply £2 17*s.* 6¾*d.* by 17.

The regular school process of working this sum, would be to multiply by 4, and again by 4, and then add the multiplicand to the result; which process requires about a score of figures; and even the rule of Practice requiries five intermediate lines of figures before arriving at the result. But if we write down the equivalent in the decimal form proposed, the quotient is obtained, as in simple multiplication, in one single line.

£	florins	
2	8	·78
		17
48	9	·26 = £48 18*s.* 6½*d.*

RULE OF THREE.

"If 10 yards of cloth cost £2 16*s.* 6*d.*, what will 120 cost?"

The usual school-boy process, as we all know from sad experience, is to reduce the money to pence; then multiply by 120, and divide by 10; afterwards convert the whole, by long divisional processes, into pounds, shillings, and pence! and these tedious operations may occupy two or three days of a boy's valuable time before he obtains a correct solution. But let us reduce the sum proposed to decimal order, and we at once obtain the correct result by a sort of railway process! Thus:—

£	s.	d.		£ florins.	
2	16	6	equiv. to	2 8	·25
					120
				10)339 0	·00
				£33 9	·00 equiv. £33 18*s.* 0*d.*

Thus, without the least alteration in the relative or existing values of our gold and silver

coinages, all the complicated money calculations of trade and commerce might be reduced to the utmost simplicity, instead of being involved in perplexity and confusion. And to accomplish this important object, it only requires a public enactment, declaring that henceforth "*the Pound sterling shall be equivalent in value to* 1000 *farthings* (or *mils*); *the Florin to* 100, *the Shilling to* 50, *and the Sixpence to* 25."

DECIMAL SYSTEM OF WEIGHTS AND MEASURES. If the decimal system be so readily applied to our currency, with what greater facility may it be applied to our weights and measures, which are even more perplexing than money calculations. What is the use, for instance, of having 16 and 12 ounces to the pound; or 14 pounds to the stone; and 112 pounds to the hundred-weight? except to puzzle people in reckoning, and destroy the meaning of a pound or hundred-weight. But the decimal system (as a judicious contemporary has observed) would make a hundred-weight a hundred pounds; and it would give 10 ounces to the pound, and 10 drams to the ounce, and 10 grains to the dram. It would rise and fall in all weights and measures by tens, and thus in calculation there would be no difficulty whatever in reducing any number of grains, say 7653, to pounds; for by cutting off the last figure you have 765·3, or 765 drams and 3 grains; by cutting off another figure you have 76·5·3, or 76 ounces 5 drams and 3 grains; and by cutting off another figure you have 7 lbs. 6 oz. 5 drams 3 grains. In other words, you have no trouble at all; for you merely read the figures, calling the fourth from the end pounds, and the rest ounces, drams, and grains in succession. There would be no compound division, as they call it.

DECIMATION, a selection of every tenth by lot, being a military system of punishing such soldiers as are guilty of mutiny or cowardice on the field. The names of the guilty are deposited in a helmet or urn, from which a tenth part is drawn, whose lot it is to suffer death.

DECK, the planked floor of a ship, which from stem to stern connects the sides together. In vessels of war there are generally three principal decks, besides those of a minor character, which bear specific names. Thus, in first and second-rate ships, the first deck, which is broader and stronger than the others, is termed the *lower gun-deck;* it usually sustains the heaviest tier of guns. The second deck is somewhat lighter in its construction than the lower one, and is named the *middle-deck;* its guns are not so heavy as those of the lower-deck. The third deck is the *upper* or *main-deck*, which is constructed much lighter than the lower decks, and usually carries guns of smaller calibre. The term is also applied to other portions of a ship, as the *quarter-deck*, which is situated on the aft part of the main-deck. It is that portion of the ship appropriated to the use of the officers, and is usually raised higher than the rest of the deck. The *half-deck* is the under portion of the quarter-deck. In frigates, war-sloops, cutters, &c., the term *gun-deck* is applied to the main or upper-deck, where the guns are placed in battery. *Spar-deck* is a term used in frigates and men-of-war, when converted into troop-ships, to designate a straight line from the forecastle to the quarter-deck, which is appropriated for the reception of spars, hammocks, and other materials for troops. In corvettes, &c., *flush-deck* implies a continued floor laid from stem to stern, upon one line, without any intervals or stops. The terms *two-decker*, *three-decker*, &c., are applied to ships with two or three decks respectively, and these terms are useful in expressing their comparative sizes and importance.

DECOCTIONS (v. 275). In pharmacy there are a variety of decoctions, both of a simple and compound character, which, in the medical profession, are known by their Latin botanical names; as *Decoctio althææ officinalis, D. anthemidis nobilis*, &c. The following, however, is an alphabetical list of some of the simple and more useful decoctions expressed in English, with the general uses to which they are applied:—

Barley (see *Compound Decoctions*).

Cabbage-tree Bark; useful as a vermifuge.

Camomile, applied in the form of clyster and fomentation.

Cardinal Flower of Virginia (blue), a purgative.

Cinchona, the Peruvian bark.

Dandelion; used in deficient and irregular action of the hepatic organs.

Elm Bark, applied to lessen the hepatic organs.

Foxglove, a very improper form for the exhibition of digitals, being variable in strength.

Iceland Moss, or Liverwort; it contains the bitter principle of the plant, united with its starch.

Liquorice, a demulcent, and vehicle for other medicines.

Logwood; used in diarrhœa and some cases of dyspepsia.

Marsh Mallow, applied as an emollient fomentation.

Mezerion; useful in glandular swellings and chronic rheumatism.

Oak Bark, applied chiefly as a local astringent in the forms of gargle, infection, or lotion.

Poppy; used as a fomentation in painful swellings, &c.

Quince Seed, applied to erysipetalous surfaces, in ophthalmia, &c.

Sarsaparilla; useful in secondary syphilis, &c.

Senega; beneficial in dropsy, rheumatism, and affection of the lungs, attended with debility and inordinate secretion.

White Hellebore; useful as a lotion in scabies, and other cutaneous eruptions.

Winter Green, in use for ascites, rheumatism, and hysteria.

Woody Nightshade, or Bitter-sweet; applied to cutaneous diseases.

The following is a list of compound decoctions in general use:—

Aloes, which resemble *beaume-de-vie*, but are less purgative.

Barley, as a compound decoction, is an elegant and useful demulcent, with an aperient tendency.

Guaiacum, commonly called *decoction of the Woods;* it has almost fallen into disuse.

Mallow; used in clysters and fomentations.

Sarsaparilla, an imitation of the once celebrated *Lisbon Diet Drink;* it differs from *Decoct. Guaiaci Comp.* by the addition of the mezereon root, which renders it diaphuretic and alterative.

Sherbet (from the Arabic word *sherb* to drink, so celebrated in Eastern song,) is a decoction of barley-meal and sugar, perfumed with roses, &c.

DECOMPOSITION (v. 275). In warm climates the decomposition or decay of animal and vegetable substances takes place much more rapidly than in the temperate or colder latitudes. The decay of animal bodies is generally attended by an ill-smelling odour, which arises from the phosphorus and sulphur they contain. The phosphorus enters into combinations which are disagreeable and injurious to health; while the sulphur amalgamates with the constituents of animal matter, and forms fetid compounds. These unite in evolving those unpleasant smells, which accompany the decomposition or decay of animal matter when under the influence of a warm atmosphere. The strength of the odours emitted, and the distances to which they are diffused through the air in warm climates, may be inferred from the shortness of time required to bring the condor or the vulture from vast distances. So strong is their sense of smelling, in comparison with that of the human organs, that they can scent afar off the carcases of animals undergoing the process of decomposition. In the dry air of some hot climates, as on the borders of the African deserts, the process of animal decay is checked, and the flesh can be dried and preserved for a length of time. It is thus that, in the dry climate of Egypt, human bodies, instead of decaying, have become shrivelled up into disgusting mummies. The same results have taken place in cool vaults, through which a current of dry air passes, and where the soil has been of an absorbing quality. Not only a certain degree of warmth is necessary to promote decomposition, but a moist atmosphere; and if these conditions are wanting, decay will proceed very gradually, or altogether cease. 'The exclusion or non-exclusion of air from fermenting vegetable and animal remains,' says Stockhardt, in his 'Agricultural Chemistry,' 'occasions a great difference in the nature of the decomposition. In the first case (as, for example, in the decomposition of animal manure, when piled together in large and compact heaps, and of urine in the drainings reservoir, in the steeping of flax, in the fermentation of preserved cheese, &c.), gases and vapours of highly disagreeable odour are generated, which may be regarded as partially-putrefied or partially-consumed substances; they are produced from want of air, or, more accurately speaking, of oxygen. This decomposition is called, simply, *putrefaction.* It has the greatest analogy to charring or dry distillation, where (as, for example, in the manufacture of common illuminating-gas or in charcoal piles), from deficiency of air, half-burnt, strong-smelling combinations, tar, ammoniacal gas-liquor, pyroligneous acid, &c., are likewise generated in large quantity. On the contrary, when the air can freely enter, these offensive gases and vapours combine with more oxygen, and now undergo *complete* putrefaction or combustion; and the products so eliminated are destitute of smell. This kind of decomposition, which is most analogous to complete combustion, and, like this, takes place with abundant and a good draught, is called *decay.*'

Although warmth and air may be excluded, still, where there is the presence of moisture, decomposition will proceed slowly, and odours of a malign influence continue to be emitted for a long period. Hence is demonstrated the pernicious custom of placing grave-yards in the vicinity of crowded neighbourhoods, where the decaying animal substances are amalgamated with earthy deposits, and are thus perpetually throwing off those noxious exhalations which are so injurious to health. The discoveries of modern chemistry, however, have enabled us, in some measure to arrest, or altogether prevent, the pernicious smells which arise from animal decay. Thus when flesh is immersed in sugar, or impregnated with common salt, or a mixture of salt and nitre, the process of decomposition is arrested. These substances fill the pores of the flesh, and effect a kind of chemical combination with the fibre of the meat, and with the substances contained in its natural juices. Volatile tarry matters, such as creosote, and other kinds of substances, known as *antiseptics,* act in a similar way. Extreme cold will also prevent decomposition, and preserve animal bodies for centuries. In the arctic regions, the freezing of flesh and fish is the usual method of preserving them from putrefaction. It is thus that, in the ice-cliffs of the Siberian rivers, the bodies of extinct species of elephants have been discovered, which may have been there, probably, for thousands of years. They were so little decayed, that the dogs and wolves greedily devoured the flesh. But even a moderate degree of cold, with the total exclusion of air, will produce similar effects, as proved by the preserved meat, which is found so useful in long voyages.

DECUMA'RIA (Gr. δέκυμα a tenth, in reference to the ten-fold structure of some of the flowers), a genus of plants of the order *Philadelphaceæ,* consisting of sarmentose shrubs, with white sweet-scented flowers and glabrous leaves. (Craig.)

DECU'RIA, among the ancient Romans, a company of ten men under one leader or officer, who was called *Decurio;* the cavalry of the Romans being divided into centuries, and the centuries into ten decuria.—*Decuriones Municipales* were a court of judges or counsellors, representing the Roman senate in the free towns and provinces. They were called Decuriones, because, at the time when Roman colonies were sent into the conquered towns, they usually chose ten men to compose a senate. Their duty was to consult the interest of the town, and the revenues of the commonwealth. Their sentences were called *decreta decurionum.*

DEFENCES, a general term in military fortification for all sorts of defences that cover and defend the various works, as the parapets, flanks, casements, and faussebrays.—*Lines of Defence* are the distances between the salient angle of the bastion and the opposite flank; that is, the

faces produced to the flanks.—*Passing Defence* is chiefly confined to inundations, and is effected by letting out water in such a manner that the level ground which lies round a fortified town or place may be entirely overflowed, and become an inert stagnant pool.—*Distant Defence* consists in being able to interrupt the enemy's movements by circuitous inundations; to inundate, for instance, a bridge when a convoy is passing, or to insulate batteries, the heads, or saps, or lodgments which have been made in the covert way.—*Line of Defence* also represents the flight of a musket-ball from the place where the musketeers stand, to scour the face of the bastion. (*Mil. Cycl.*)

DEFOLIATION, a term in botany, applied to the yearly shedding of leaves, in opposition to the word *frondescentia*, which is the annual renovation of the leaves, produced by the opening of the buds in spring. These terms are only applied to shrubs and trees, and not to herbs which perish every year down to the root, and lose both leaves and stem.

DELFT-WARE, a rough kind of porcelain, which is enamelled, and sometimes ornamented with coloured figures or pictorial designs. It is so called from having been originally manufactured at Delft in Holland. The basis of this sort of pottery is a mixed clay, composed of three parts of blue clay, two red, and five marl; and these form the composition used in our manufactories generally. The red clay is added to give greater solidity to the material, because, on account of its ferruginous properties, it possesses the binding qualities required. The material, having been properly tempered and moulded, is first highly baked in a slow oven, and then covered with glazing or enamel, which is usually made of sand and flints, oxide of lead or tin, and vitrifiable salts. In this half-finished state, the vessels are painted with colours consisting of metallic oxides, with which fusible glass is mixed and ground. After being well dried, they are again baked in an oven sufficiently hot to fuse the enamel, when the articles are presumed to be complete.

DELHI. Since the publication of our general account (v. 595), this ancient city has been the scene of many sanguinary conflicts. In the rebellion of the Sepoys, or native regiments of India, which took place in the summer of 1857, Delhi was the place where the greatest atrocities were committed. The spirit of insurrection first manifested itself among the native troops of the 11th Regiment. Col. Finnis, observing their mutinous spirit, endeavoured, by conciliatory language, to tranquillize them; but he was treacherously shot by a sepoy of the 20th Regiment. Soon afterwards the flames of incendiarism began to ascend in all directions; and the mutinous soldiery were joined by the mob. At the very commencement of the outbreak, the 3rd Native Light Cavalry mounted their horses, and galloped off to the gaol, when, overpowering all resistance, they liberated all the prisoners, amounting to 1800. On their return they joined the mutineers of the 20th Native Infantry, and carried on the work of indiscriminate massacre of every European, without regard to age or sex. They were joined by three native regiments, and the native artillery. They immediately attacked the king's palace, the fort, the arsenal, the civil station, and other places, which were all captured; with the exception of the arsenal and magazine. Having taken possession of the palace, the mutineers immediately sought out the king, the last lingering relic of the decayed Mogul dynasty,—and at once proclaimed him their sovereign; but his acceptance of regal honours appears to have been compulsory; for he gave the first information of the mutiny to Mr. Colvin, the lieutenant-governor of Agra, near Delhi, who was enabled, by his energetic measures, to save that place from capture and pillage. The city of Delhi, however, remained in complete possession of the mutineers. But the month of September, of the same year, will be ever memorable, in the annals of Indian warfare, for the indomitable bravery of a mere handful of British troops, who eventually succeeded in recapturing the place, and avenging the massacres of Meerut, Cawnpore, and Delhi. On the 4th of September, Brigadier-General Nicholson arrived with a long siege-train of artillery, escorted by a wing of the 8th Foot, two companies of the 11th, and a wing of the 1st Belooch battalion of the Bombay army. On the 6th and 7th other reinforcements arrived; when the advanced batteries immediately opened fire on the fortified walls of Delhi. The heavy artillery was brought to bear on the different bastions; but the fire of the enemy in return was most formidable, and serious losses were sustained by the besiegers. On the 13th of September, the Cashmere bastion, and the adjoining curtains on each side, with the Water bastion, were a heap of ruins; and the fire of the enemy completely silenced. The period for a general assault had now arrived, when General Wilson, the commander of the besieging force, issued a general order, expressing his conviction that 'British pluck and determination would carry everything before them, and that the bloodthirsty and murderous mutineers, against whom they were fighting, would be driven headlong out of their stronghold, or be exterminated.' On the 14th the assault took place, in four columns. On the western side the assailants, consisting of the Cashmere contingent and the Ghoorkas, were repulsed; but on the northern side the British troops entered at the breach with no serious opposition, and spreading to the *right* and left occupied the whole line of defence from the Water bastion to the Cabul Gate. Preparations were immediately made for shelling the enemy out of the palace, the Selimghur, and the other strong places of the city. The magazine was captured; and a chain of posts was established from thence to the Cabul Gate. The enemy were then only able to maintain a desultory warfare from the tops of the houses. No quarter was given to the armed sepoys. On the 21st of September the whole city was in our possession. The King of Delhi fled with his wife and two sons; but they were pursued and captured; and the latter put to death; while the mock-king himself was subsequently tried, convicted, and condemned.

Thus the city of Delhi was won step by step after twelve days' fighting, yet the loss, on the side of the British, was very severe. In the assault of the 14th, no less than 61 officers and 1178 men were killed. But Delhi was the nucleus and head-quarters of the mutineers; and its capture might be considered the salvation of the Indian empire.

DELIMA'CEÆ (Lat. *delimo*, to file or shave off, because the leaves are useful in polishing), a tribe of plants, of the order *Dilleniaceæ*, which consist of climbing shrubs.

DELOS'TAMA (Gr. δῆλος manifest, and στόμα a mouth; in reference to the wide opening of the calyx), a genus of plants, of the natural order *Bignoniaceæ*; natives of Peru. They are distinguished by large racemose rose-tinted flowers, and frondose leaves.

DELPHIN CLASSICS, a term applied to that series of Latin classics, published for the use of the young son of Louis XIV., the Dauphin of France; or, as the title-pages express it—'*in usum serenissimi Delphini.*' Some of the most famous scholars of the age were engaged in the production of this great work,—the chief of whom were the Dauphin's governor Montausier (who had the general superintendence), Bossuet, and Huet, with thirty-six others, as assistants. The text of each author is accompanied with a Latin interpretation and copious annotations, by which the labours of the student are greatly facilitated. Hence have the Delphin classics become the favourite text-books of our schools both in England and elsewhere; although the typography, of late years, has been very incorrect, owing, perhaps, to the cheapness at which the volumes are usually published, and the employment, especially in London, of incompetent correctors of the press; many of whom have scarcely any knowledge of the Latin language.

DELPHIN'IUM (v. 30). In the lofty Himalayas, there is a species of this plant, known as the *Delphinium glaciale*, growing at the height of 17,000 feet, which has so strong a smell of musk, that the natives believe the musk deer, an inhabitant of the mountain slopes, derives its smell from eating this plant. There is also another species, the *D. brunonianum*, found on the western slopes of the same mountains, which has a similar smell of musk, though not so disagreeable as the preceding. But it does not appear that science has yet been able to explain the nature of the musky-smelling substances contained in these Asiatic plants. (Dr. Hooker.)

DELUGE. Of the various deluges recorded in ancient history, that of Noah's Flood is the most important, being, as we are taught to believe, a universal inundation that destroyed every living thing on the face of the earth, except Noah and his family, and the animals contained in the ark. This flood forms a most important event in ancient history; and is one of the leading epochs in chronology. Its history is given in the book of Genesis; and its time is fixed, by the best chronologers, about 1656 years after the creation; thus answering to the years before Christ 2293. From this flood the state of the world is divided into diluvian and antediluvian. In ancient history, however, we find mention made of various deluges, as having taken place at different periods. That which happened in Greece, in the time of Deucalion, called Diluvium Deucalidoneum, of which Ovid has given a copious account, is the most famous in classical history. This deluge, it is supposed, only overflowed Thessaly, and the surrounding countries. Its date is fixed to the year before Christ 1529; being the third year before the Israelites came out of Egypt, according to the computation of Petavius. The deluge of Ogyges happened near 300 years before that of Deucalion, 1020 before the first Olympiad, and 1796 years before Christ, according to the same author. This, it is conjectured, only inundated Attica, and other parts of Greece.

The theory of the universality of the deluge appears so incompatible with the physical laws now generally understood and admitted, that we are compelled to arrive at the conclusions which have been so forcibly expressed by the Rev. T. Milner, in his 'Gallery of Nature,' when speaking of the 'distribution of animals' over the face of the globe. 'The theory embraced with reference to animal distribution,' says the learned author, 'may appear to some readers at variance with the authority of Revelation, which, according to popular interpretation, teaches the collection of types of all living races into the Noachian ark, the occurrence of a universal deluge destroying the other members of each family, and the subsequent dispersion of the preserved stock from one common centre, the mountains of Ararat, to repopulate the world. With this theory of Linnæus and Pennant it is impossible to reconcile zoological facts, without supposing a series of the most astounding and useless miracles, concerning which a total silence is preserved in the Scripture narrative. We know that the kangaroos and emus of New Holland, the llamas of Peru, the sloths, armadillos, and ant-eaters of Paraguay, to mention no other instances, never could have accomplished the passage from their places of location, to any central part of the Old World, and back again, from the scene where the ark of Noah was set afloat by natural means. Neither can the polar bear and the hippopotamus, the ostrich and the eider fowl, the reindeer and the giraffe, to refer to no more examples, exist together in a state of nature, requiring a great diversity of climate; and supposing them aggregated by the Divine Power, and sustained in a common temperature, the difficulty of conceiving a building capable of accommodating a tenth of the single parent pairs of all the species is prodigious.'—'When no recognised principle of interpretation is violated by a contrary hypothesis, which accords with zoological conclusions, we may reasonably believe the Noachian deluge to have been limited to the world of man—probably the western region of Central Asia, the native seat of most of the domesticated animals, and the cereal grasses, upon which the food, clothing, and convenience of mankind depend, reproductive examples being preserved, to minister to the wants of the patriarchal family, and to multiply and migrate, in the train of their

posterity, to the far-distant regions to which they have wandered.'

DEMI-CULVERIN, in military matters, a piece of ordnance, which usually carries a ball of 4¼ inches diameter, and 10 lbs. 11 oz. weight. The smallest size is 10 feet long, and 4 inches diameter; and carries a ball of 9 lbs. weight. The largest is 10⅔ feet in length, and carries a ball 4½ inches in diameter, and of 12 lbs. 11 oz. in weight—the point blank shot being 178 paces.

DEMI-GORGE, in fortification, half the gorge or entrance into the bastion, not taken directly from angle to angle, where the bastion joins the curtain, but from the angle of the flank to the centre of the bastion, or the angle which the two curtains would make by their prolongation.

DEMI-LUNE, in fortification, a work constructed to cover the curtain and shoulders of the bastions. It is composed of two faces, forming a salient angle towards the country, has two demi-gorges formed by the counterscarp, and is surrounded by a ditch. A réduit may be constructed in its interior, where there is sufficient room. The faces of this work are parallel to those of the demi-lune, at a distance of about thirty yards. It has flanks drawn parallel to its capital. The réduit serves as a retreat for the troops, when obliged to abandon the demi-lune, from which it is separated by a ditch of six toises; and also as a check to the enemy establishing himself in that work. In civil architecture, *Demilune* is a building, the plan of which is a circular hollow, resembling an amphitheatre, in order to gain ground in front. (*Military Cyclopedia.*)

DEMI-RELIEVO, in sculpture, is that kind of relief which presents only one-half of the figure or object, as rising from the plane or surface.

DEMIUR'GUS (Gr. δῆμος the people, and ἔργον a work), a term applied by the Platonian philosophers to an exalted and mysterious agent, by which the Omnipotent was supposed to have created the universe. The word corresponds with the *Logos* of the Platonizing Christians of the early church, or the *Word* of St. John the Evangelist. The term was also applied, by the classical Greek writers, to any skilful artificer.

DEMOGOR'GON (Gr. δαίμων a spirit, and γοργὸς terrible), in Mythology, the name of some terrific and mysterious divinity, to whose magic influence all the inhabitants of Hades were subjected. According to some mythological writers he was regarded as the demiurgus of creation.

DEMON (Gr. δαίμων a spirit), a name given by the classical ancients to a kind of spirit, which presided over the actions of mankind, and was equivalent, in many respects, to those spiritual existences in the Bible termed Angels. Some of the ancient philosophers maintained that every man had two of these demons; the one good, and the other bad; and this doctrine was very prevalent among the oriental nations, especially the Persians. The demon of Socrates is celebrated in classical history. He publicly declared that he was accompanied by a demon or invisible conductor, whose interposition frequently prevented the commission of evil, or any flagrant misconduct. Those demons were something like the genii of eastern story; and though at first they were only looked upon as the subordinate ministers of the superior divinities, in course of time they received divine honours, and we often meet with statues and altars erected to them, and inscribed *genio loci*. From the genii and peris of the East arose the belief in fairies and other creations of a superstitious age. (Plut. *de Gen. Soc.*; Cic. *Tusc.*)

The word demon frequently occurs in both the Old and New Testaments; and is there translated *devil;* but that was by no means its acceptation among the Greeks; for we have frequent mention of *Agathodemons* (good demons) as well as *Kakodemons* (evil demons), which were supposed to be supernatural spiritual existences that accompanied or took possession of individuals, especially of the insane. Thus in Scripture history a *Demoniac* was one supposed to be under the influence of demons or devils, so frequently mentioned in connection with the miracles of Christ. In the Middle age the word demon was restricted, as in the New Testament, to devils or fallen angels.

DENA'RIUS (v. 307), in our monetary system of accounts, an English penny, of which the letter *d*, or initial of *denarius*, is the representative. In the Middle age, the *Denarius St. Petri*, or Peter's pence, was an annual payment of one penny from every family to the Pope, and paid on the feast of St. Peter. The *Denarius Dei* (God's penny) was the earnest money given and received by parties in contracts, &c. *Denarius tertius comitatus* was the term applied to the third part (or penny) of the county-court fines which was paid to the earl, who had it in specie, or received an equivalent for it out of the exchequer; the other two-thirds of the fines being reserved for the king. (*Paroch. Antiq.*)

DENBIGHSHIRE, N. Wales (v. 318–21). According to the census of 1851, the population was 92,588, and the inhabited houses 19,124. The population of the principal towns was as follows:—

Denbigh	p. 3591	Ruabon	11,507
———	bor. 5498	Ruthin	p. 1333
Holt	p. 1536	———	bor. 3373
———	bor. 1029	Wrexham	p. 15,520
Llangollen	5260	———	bor. 6714
Llan Rwst	3984		

DEN'DRACHATE (Gr. δένδρον a tree, and ἀχάτης an agate), a variety of agate, with representations of mosses, ferns, trees, &c. upon it. In these minerals there is a colouring matter of dentritic manganese.

DEN'DRITE, an arborescent mineral, on or in which appear the figures of trees or shrubs.

DENDRI'TES, a term in geological arborization, applied to those figures of vegetables which are frequently observed in fossil substances. They are seen, on the surface of calcareous stones, of a brown colour, and sometimes approaching to a reddish yellow; but those found internally are of a very dark colour. Some of the stones in which the dendrites are found are held in high estima-

tion, as the agate, the sardonyx, the carnelian, and other precious stones, brought from eastern countries.

DENDROB'ATES (Gr. δένδρον a tree, and βατεύω to ascend), in ornithology, a genus of birds, belonging to the *Picianæ*, or Woodpeckers; and of the family *Picidæ*.

DENDROCHI'RUS (Gr. δένδρον a tree, and χείρ the hand, so called from the pectoral rays being branched), a genus of fishes, belonging to the family *Scorpenidæ*, whose bodies are scaly, pectoral fins short, the rays branched, and the head spinous and compressed.

DENDROCIT'TA, a genus of birds in India, belonging to the Crow family.

DENDROCOLAP'TES (Gr. δένδρον a tree, and κολάπτω to cut with the beak), a genus of birds, belonging to the *Certhianæ*, or Creepers, of the family *Certhiadæ*. The *Dendrocops*, or Prater, is of the same genus and family.

DENDROCYG'NA (Gr. δένδρον, and Lat. *cygnus* a swan), the Tree Duck, a genus of aquatic birds, belonging to the *Anserinæ* and swans, of the family *Anatidæ*. They are so called because they are able to perch on trees, owing to their toes being sufficiently long to project beyond the web-footed membrane.

DENDROI'DES (Gr. δένδρον, and εἶδος resemblance), a genus of coleopterous insects, of the tribe *Ostridæ*, which are found under the bark of trees.

DEN'DROMA (Gr. δένδρον, and δρομὰς running swiftly), a genus of birds, of the family *Certhiadæ*, belonging to the *Anabatinæ*, or Tree-runners.

DENDROM'ETER (Gr. δένδρον and μέτρον, a tree measurer), an instrument for measuring the length and diameter of trees, in any situation or place on which they may rest. It also measures the length and diameters of the boughs by mere inspection. It consists of a semicircle divided into two quadrants, and graduated from the middle. On the diameter hangs a plummet for fixing the instrument in a vertical position. It may be also used for taking angles, whether horizontal, oblique, or vertical. When fitted to a theodolite it may be applied to the measurement of objects, accessible or inaccessible.

DEN'DROMUS, a genus of birds, of the family *Picidæ*, and belonging to the *Picinæ*, or Woodpeckers.

DENDRONES'SA (Gr. δένδρον, and νῆσσα a young animal), the Tree-ducks, of the family *Anatidæ*.

DENDROPH'AGUS (Gr. δένδρον, and φάγω to eat), a genus of coleopterous insects, of the family *Prionidæ*; they are found beneath the bark of trees. The *Dendrophilus* is of the same genus and habits, but belongs to the family *Œstridæ*.

DENDROS'TRÆA (Gr. δένδρον, and ὄστρεον an oyster), a genus of Mollusca, belonging to the Oyster family, or *Ostracidæ*.

DENMAN, RIGHT HON. LORD, CHIEF JUSTICE OF THE QUEEN'S BENCH, was born in London, in 1779. He received the early rudiments of his education at Palgrave School, near Diss, in Norfolk, which was then under the management of Mr. and Mrs. Barbauld; and he was sometimes wont to relate, in after-life, that he had received from that accomplished lady the rudiments of instruction, and the first lessons of discipline. He subsequently became a member of St. John's College, Cambridge, where he graduated M.A. 1803. He was called to the bar by the Hon. Society of Lincoln's Inn, in 1806. He was introduced into parliament in 1818, by Mr. Calcraft, who had him returned for the borough of Wareham; and at the general election of 1820 he was elected for Nottingham. In the House of Commons he immediately distinguished himself by his earnest advocacy of popular freedom—side by side with Brougham and Lambton,—on all the many occasions furnished by the troubled years of 1819 and 1820. On the 8th Feb. 1820, Mr. Denman was appointed Solicitor General to Queen Caroline; and in 1821 the freedom of the City of London was presented to him for his conduct on the Queen's trial. On the 26th April, in the following year, the city elected Mr. Denman to the office of Common Sergeant. In 1830, on the formation of Earl Grey's administration, Mr. Denman was appointed Attorney-General to King William IV. He continued to occupy that important post during the debates on parliamentary Reform. On the 8th Nov. 1832, on the death of Lord Tenterden, he was appointed Lord Chief Justice of the King's Bench, and sworn a Privy Councillor. In 1834, by patent, dated March 28, he was raised to the peerage. After having presided in the Court of Queen's Bench for more than seventeen years, Lord Denman retired, on the ground of ill health, in March 1850. He died in 1854.

DENSITY OF BODIES (v. 331), is that property directly opposite to rarity, whereby they contain such a quantity of matter under such a bulk. Accordingly a body is said to have double or triple the density of another body, when their bulk, being equal to the quantity of matter in the one, is double or triple that in the other. Professor Leslie observes, that air, compressed into the fiftieth part of its volume, had its elasticity fifty times augmented. If it continued to contract at that rate, it would, from its own incumbent weight, acquire the density of water at the depth of thirty-four miles. But water itself would have its density doubled at the depth of ninety-three miles, and would attain the density of quicksilver at the depth of 362 miles. In descending, therefore, towards the centre, through nearly 4000 miles, the condensation of ordinary substance would surpass the utmost powers of conception. Dr. Young says, that steel would be compressed into one-fourth, and stone into one-eighth of its bulk, at the earth's centre. However, we are yet ignorant of the laws of compression of solid bodies beyond a certain limit; though, from the experiments of Mr. Perkins, they appear to be capable of a greater degree of compression than has generally been imagined.

As to the densities of the planets, we find, that in homogeneous, unequal, spherical bodies, the gravities on their surfaces are as their dia-

meters when the densities are equal, or the gravities are as the densities when the bulks are equal; therefore, in spheres of unequal magnitude and density, the gravity is in the compound ratio of the diameters and densities, or the densities are as the gravities divided by the diameters. Knowing, therefore, the diameters of the planets, and the gravities at their surface by means of the revolution of the satellites, the relation of their densities becomes known. And as the mean density of the earth is found to be about four times and a half that of water, the densities of the planets, with respect to water, are as follow:—Water, 1; the Sun, $1\frac{2}{5}$; Mercury, $9\frac{1}{3}$; Venus, $5\frac{1}{12}$; the Earth, $4\frac{1}{2}$; Mars, $3\frac{2}{7}$; the Moon, $3\frac{10}{11}$; Jupiter, $1\frac{1}{4}$; Saturn, $0\frac{13}{32}$; Herschel $0\frac{29}{100}$.

DENTEX (Lat. *dens* a tooth), a genus of fishes, of the family *Chætodonidæ*, and subfamily *Sparianæ*, with a row of strong conic teeth in each jaw.

DEN'TIFRICE (from *dens* a tooth, and *frico* to rub), commonly known as 'Tooth Powder,' is usually composed of some substance possessing a certain degree of hardness or grittiness, as chalk, cuttlefish, charcoal, &c., scented with myrrh, orris root, or some volatile oil. These substances, being insoluble, are apt to collect between the folds of the gum and the neck of the teeth, and form a coloured line, and, in order to hide this disfigurement, Dentifrices are frequently coloured red with Armenian bole.

Rhatany, catechu, and Peruvian bark, are frequently used in the composition of dentifrices, and are good astringents. Charcoal and cuttlefish are useful as detergents. Camphor is sometimes an ingredient. Orris root and myrrh are chiefly employed for their odoriferous properties. The chief desideratum is the employment of a substance, as a base, that possesses a sufficient degree of hardness to cleanse the teeth from foreign matter without injuring the enamel. Soluble substances are sometimes employed, such as common salt, phosphate of soda, cream of tartar, &c. Disinfecting and decolorizing tooth powders owe their efficiency to the presence of a small portion of chlorinated lime. They are useful for correcting the unpleasant odour of the breath, and removing decolorization of the teeth, arising from tobacco or other causes.

DENTILS, a term applied to the projections, or square blocks, resembling teeth, in the cornice mouldings of the Grecian orders of architecture. There are certain rules for regulating their size and distances. Thus, according to Vitruvius, the intervals between each should be two-thirds of their breadth, and their breadth half their height.

DENTIROS'TRES (Lat. *dens* a tooth, and *rostrum* a beak), a tribe of birds, of the order *Insessores*, or Perching-birds.

DENUDATION, in geology, is a term extensively applied to the force of rivers in carrying away portions of the solid materials of the land through which they flow; and also to the tidal currents of the ocean, which not only lay bare the rocky materials of its shores, by washing away their superficial deposits, but frequently sweep away the solid masses themselves. Thus it is by the process of denudation that the whole extent of our eastern coast is deprived of earthy and silicious matters by the tidal current of the German Ocean, which, for instance, undermines and sweeps off the trap rocks, the gneiss, the granite, and the sandstone of Shetland, and washes away the loam and the gravel of the cliffs of Holderness, Suffolk, and Norfolk. Though now averaging more than 100 feet in height, they are gradually washing away at the rate of from one to six yards annually. This denuding current also sweeps away the chalk with its flints for many miles continuously on the shores of Kent and Sussex, and forces the strata of London clay on the coast of Essex and the Isle of Sheppy. This same abrading current commits annual ravages on the coast of Hampshire, and continually saps the foundations of the Portland limestone. Thus it is evident, that while, by the action of rivers, the soil and other matters are transported from far inland situations, and brought to the sea, they are borne by the currents of the ocean, which sweep along the coasts, to a much greater distance from their original site.

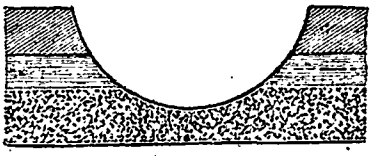
In speaking of the denuding force of rivers, Sir George Staunton calculated that the Hoang Ho, one of the largest and most rapid rivers in China, brought down, in a single hour, two million feet of earth, or forty millions daily. The Yellow Sea receives this immense detritus; and there is no question but that in course of ages the navigation will be impeded, or parts of it converted into mud-banks or terra firma, like the great deltas of the Nile or the Ganges. Captain Hall, of the Lyra, sailed across this sea, in 1816, on his voyage to Loo Choo, when it was discovered that the vessel was at one time actually sailing with her keel in the mud, which was indicated by a long yellow train in her wake.

If we are to rely on the statements of Major Rennell, the denuding process of the Ganges is so great, that in the flood season one-fourth of the water is absolute mud. He states the mean quantity discharged by the river throughout the year to be 80,000 cubic feet a second, but 405,000 feet when the river is in flood. On these data, Mr. Lyell, the geologist, has made a calculation, that, if we assume the mud to be equal to one-half the specific gravity of granite, the weight of matter denuded and carried down in the flood season would be about equal to seventy-four times the weight of the great pyramid of Egypt. He reduces his calculations to the following formula:—'405,000 feet of water per second gives in round numbers 100,000 cubic feet of mud per second, which × 86,400, the number of seconds in twenty-four hours, = 8,641,100,000, the quantity of cubic feet of mud going down the Ganges per diem.' He then proceeds to say, that, 'assuming the specific gravity of mud to be half that of granite, the matter would equal 4,320,550,000 feet of granite. Now, about twelve and a half cubic feet of granite weigh one ton; and it is computed that the great

pyramid of Egypt, if it were a solid mass of granite, would weigh about six millions of tons.'

Such is the ever-acting process of denudation that rolls down these mighty masses of alluvial and silicious materials; a considerable portion of which contributes to the formation of new land at the mouths of the Ganges, or sweeps onwards into the Bay of Bengal,—there to form fresh strata of soil in the bed of the ocean. It was thus, that Captain Sabine, at not less than three hundred miles from the mouth of the deep-rolling Amazon, found the sea discoloured by the muddy waters of that mighty river. In the same manner, the denudations and sedimentary matter which the vast Mississippi, and other rivers east of the Alleghanies, are constantly discharging, are swallowed up by the deep-rolling currents of the gulf stream, and still further distributed, as new formations, over the submarine beds of the North Atlantic Ocean. Such is one of the principal causes of the great physical changes which are constantly operating on the geological structure of the earth's surface.

Valleys of Denudation are almost of universal occurrence on the superficies of the earth's surface. They have evidently been produced by the action of rushing bodies of water, at some period subsequent to the formation of the rocky surfaces of the earth. This is demonstrated by the undisturbed state of the deposits on each side of the valley; of which there are numerous instances in Kent, Dorset, Devon, &c. Thus, if a direct line were carried from one side of the valley to the other, it would run in the plane of the stratification, as here illustrated:—



VALLEY OF DENUDATION.

It is observed by Mr. Calcott, that 'if a person were to see the broken walls of a palace, or a castle, that had in part been demolished, he would trace the lines in which the walls had been carried, and in thought fill up the breaches and unite the whole. In the same manner, when we view the naked ends and broken edges of strata on one side of a valley, and compare them with their corresponding ends on the other, we cannot but perceive that the intermediate space was once filled up, and the strata continued from mountain to mountain.'

These effects can only be attributed to moving floods of water, rushing on with violent impetuosity; and while acting on the surface of rocks, and breaking down every opposition, they transported boulders, and the components of the masses of gravel which everywhere abound. 'It is well known,' says Higgins, 'that many districts in this country are covered with beds of gravel, which consist of fragments of rock and rounded pebbles. These fragments and pebbles will be found, if examined, to consist in many places of rocks, which are not to be obtained in this neighbourhood where the gravel is deposited. In many districts of the midland counties in England, a nearly complete suite of rocks might be collected from the gravel, and must therefore have been carried from various, and some from very considerable distances.' In Holderness, on the coast of Yorkshire, there are some striking proofs of the denuding action of water. Speaking of the superficial gravel or rocky detritus of the locality, Mr. Phillips thus observes:—'The rocks from which the fragments appear to have been transported, are found, some in Norway, in the Highlands of Scotland, and in the mountains of Cumberland; others in the western and north-western parts of Yorkshire; and no inconsiderable portion appears to have come from the sea-coast of Durham, and neighbourhood of Whitby. In proportion to the distance they have travelled is the degree of roundness they have acquired.'

(Sir G. Staunton; Major Rennell; Lyell; Higgins.)

DEODORI'ZERS are those bodies which neutralize or destroy miasmatic infections, of which charcoal, in its various forms, is the most efficacious. This body produces a deodorizing effect upon almost every variety of decaying animal or vegetable matter; and mixed with the contents of our common sewers, it sweetens them almost immediately. Peat charcoal has been found so effective, in the deodorization of miasmata, that it has been adopted in sanitarian measures for removing the smells of drains, cesspools, graveyards, and other places where animal and vegetable offal has been allowed to accumulate. This peculiar action in charcoal is the result of three properties,—its remarkable porosity; the special affinity which it exhibits for strong-smelling substances; and the oxidizing influence it appears to exercise upon the substances it absorbs. So powerful is the affinity of charcoal for strong-smelling substances, that if a table-spoonful, finely powdered, be shaken up with a pint of stinking ditch water, and the mixture filtered, the water will pass through bright and clear, and with little of either taste or smell. If the same be commingled with porter or wine, the colour, smell, and taste, by a kind of chemical action, will altogether disappear. It appears to exercise an oxidizing influence on the substances it absorbs, which, whether gaseous or solid, strongly coloured or strongly smelling, as soon as they are laid hold of by the charcoal, begin to unite with oxygen, then to lose their characteristic properties, and to change into chemical compounds.

There are other substances which possess the chemical qualities of efficient disinfectants in a high degree; especially chlorides of lime, of iron, and of zinc. The first consists of lime, and chlorine; the lime combining with all the acid bodies represented by the sulphuretted hydrogen; and the chlorine either combining with or decomposing the alkaline compounds represented by ammonia. In febrile chambers it is invaluable as a deodorizer or disinfectant. Thus when

dissolved in water, and sprinkled over a fetid-smelling chamber, it instantly disperses the sickly smell, and diffuses a refreshing sweetness. When in the solid form, if spread on any decomposing or fermenting mass, it quickly destroys the noxious qualities. Where water-closets, cess-pools, or heaps of fermenting matter are to be freed from smell, chloride of lime is the best agent; but chloride of zinc and the sulphate of iron, both of which are to be purchased in the shops, are perfectly efficient. To the class of deodorizers also belong quicklime, muriatic acid, sulphurous acid, nitric oxide, the sulphate and pyrolignite of iron, iodine, and iodoform.

DEOXIDATION, a term employed in chemical language to signify the abstraction of oxygen from any substance. A good illustration of this action is afforded in the deoxidation of acetate of copper by grape sugar. When boiled with the salt of copper, the sugar abstracts one atom of oxygen from every two atoms of oxide of copper, and the result is the formation of a sub-oxide. Several bodies possess this power of deoxidizing, under certain conditions. Many metals deoxidize nitric acid when dissolved in it:—carbon or charcoal deoxidizes many substances when heated with them, and on this fact is based many of the processes for the reduction of metallic ores.

DEPILATORIES (Lat. *depilo* to strip off hair), chemical agents made use of for the removal of superfluous hair. Great caution should be observed in the employment of these compounds, as they are frequently largely composed of quicklime and orpiment, or tersulphuret of arsenic; and this latter compound is dangerous, especially if the skin is at all abraded. A strong solution of sulphuret of barium, made into a paste with powdered starch, is the best and safest depilatory. It should be applied immediately it is mixed, and allowed to remain for five or ten minutes, and the hair should then be removed with the back of a knife.

DEPOSIT, in geology, any stratum or formation of earthy or silicious matter laid or thrown down after being suspended in or carried along by water; as mud, gravel, chalk, clay, or stones. In the course of ages, these aqueous deposits have produced *formations*, as the geologists term them, which may consist of stratified rocks or beds of sand, chalk, flint, coal, shale, sandstone, ironstone, or other material. These formations, which have been deposited at different ages of the world's crust, have been divided by geologists into the *superficial*, *tertiary*, *secondary*, *transition*, and *primary*. The *superficial* formations merely embrace the surface soil, and consist of deposits of sand, clay, and gravel, formed by the ordinary action of water. These are considered as modern or *alluvial* deposits. The more ancient or *diluvial* deposits chiefly consist of gravel and clay, intermingled with boulder stones more or less rounded by trituration, as if they had been transported from one spot to another by the rolling action of water. [DENUDATION, *Supplt.*] The *tertiary* formation consists of an extensive range of marine and fresh-water deposits, such as thin beds of sand, clays, marls, and imperfectly-formed limestone. Here are found extensive remains of animals and vegetables, many of them belonging to extinct species. The *secondary* formation is composed of vast beds or deposits of clay, chalk, sandstones, limestone, argillaceous slate, coal, ironstone, &c., in which vegetable remains are abundant, and the lizard-shaped animals are found. The *transition* series is intermediate between the tertiary and secondary formations. It is chiefly composed of limestone rocks, sandstones, slate, and shale, and contains very few organic remains, and those of the lowest organism. The *primary* formation of the earth's crust consists of immense deposits of crystalline rock, or beds of hard and compact slaty strata, where no organic remains are to be found. With the advance of geology, these respective formations have been discovered to consist of systems of stratified deposits, each having a distinct character, so as to admit of their being classified and grouped. Thus the stratified rocks, which are all deposits of aqueous origin, show a regular divisional structure of beds or layers, the result of successive sedimentary processes at the bottom of seas, lakes, or rivers. They vary considerably in thickness, and are sometimes separated by a thin layer of earthy matter. The deposits which constitute this class of rocks are not uniformly horizontal, which would have been the case if no disturbing causes had operated to prevent it, but are often seen to dip down to some point in the horizon, or to form undulating lines. Thus the operation of some elevating cause, to which various stratified deposits have been exposed, has frequently interrupted their continuity, and produced fissures and cracks filled with igneous injections from below, or fragments of other deposits from above.

Taking a general review of the stratified deposits of our own island, we find that, if we travel from the metropolis in a north-west direction, we successively meet at the surface with different groups of strata. Thus, in the vicinity of London, we find the tertiary deposits covered with accumulations of alluvium, and spreading over nearly the whole of the eastern coast of England, as far as the Humber. In the counties of Bedford, Buckingham, and Hertford, we meet with deposits of chalk, while the oolite prevails in Northamptonshire, and the new red sandstone and carboniferous deposits in Leicestershire and Staffordshire. In Shropshire we meet with the old red sandstones and Silurians; and in the mountainous western districts of Britain we have the Cambrian, mica-schist, and gneiss groups. On travelling northward we find, for instance, in Herefordshire, the old red sandstone; in North Wales, the slaty deposits; in Durham, the magnesian limestone and carboniferous strata; while in Northumberland and other northern counties, coal-fields abound to an almost illimitable extent.

(Lehman; Werner; Lyell; Dr. Macculloch.)

DERBYSHIRE (v. 344–8). According to the census of 1851, the population of the entire county was 296,084, of which 147,737 were males, and 148,347 females. Of houses, inhabited

and uninhabited, there were 61,869. The population of the principal places was as follows:—

Alfreton	8,326	Glossop	5,467
Ashborne	2,418	Heanor	3,427
Ashover	2,445	Hope	4,604
Bakewell	2,217	Ilkeston	6,122
Belper	10,082	Matlock	4,010
Brampton	4,409	Melbourn	2,680
Chapel-en-le-Frith	3,214	North Wingfield	4,351
Chesterfield	7,101	Ockbrook	7,163
Claylane	2,278	Staveley	3,998
Crich	2,562	Tideswell	2,035
Derby	40,609	Whitfield	4,774
Dronfield	2,469	Whittle	2,691
Duffield	2,926	Wirksworth	2,632
Eckington	4,958		

DER'ELICT, in law, any commodity abandoned or thrown away by the owner, or a tract of land left dry by sea, and fit for cultivation. Thus the term *dereliction* is applied to the retiring of the sea from parts of the coast, and also to lands going from the sea, on account of alluvial deposition, or from the alterations in the relative levels of land and sea. This derelict land, when gradual, goes to the owner of the land.

DERMABRAN'CHIATES (Gr. δέρμα the skin, and βράγχια gills), a family of snails, or gasteropodous mollusca, whose gills occur externally in the shape of thin membranous plates or filaments.

DERMAPTE'RIANS (Gr. δέρμα the skin, and πτερόν a wing), an order of insects consisting of those genera which have the elytra entirely coriaceous. The tail is armed with a forceps, and the two membranous wings are folded longitudinally.

DEROS'TOMA (Gr. δέρη the neck, and στόμα the mouth), a genus of Entozoa, of the family *Acanthocephala*, and order *Parenchymata*.

DERTROI'DES (Gr. δέρτρον a bill), a genus of birds of the family *Fringillidæ*, belonging to the *Coccothraustinæ*, or Hardbills.

DETER'GENTS, agents used by the medical profession for cleansing wounds, ulcers, &c., and exciting a healthy action in them. The term is derived from *detergo* to wipe away. They are used in the form of ointments, liniments, and lotions.

DEVONSHIRE (v. 372–7). According to the census of 1851, the population of the entire county was 567,098; of which 269,583 were males, and 297,515 females. Of houses, inhabited and uninhabited, there were 104,401. The population of the principal places was as follows:—

Ashburton	3,432	Dartmouth	4,508
Axminster	2,769	Dawlish	2,671
Bampton	2,102	Devonport mun.	38,180
Barnstaple	11,371	—— parl.	50,149
Beerferris	3,401	Exeter mun.	32,818
Bideford	5,775	—— parl.	40,688
Braunton	2,364	Exmouth	5,123
Brixham	5,627	Heavitree	3,112
Colyton	2,504	Honiton	3,427
Crediton	3,934	Ilfracombe	2,919
Cullompton	2,765	Kingsbridge	1,679
Culmstock	1,224	Marlborough	2,354
Modbury	1,858	Sidmouth	2,516
Moreton Hampstead	1,858	Southmolton	4,482
Newton Abbot	3,147	St. Thomas	4,577
Northam	3,680	Tavistock	8,086
Okehampton	2,165	Teignmouth	5,013
Ottery St. Mary	2,534	Teignmouth West	3,389
Paington	2,746	Tiverton	11,144
Plymouth	52,221	Topsham	2,717
Plymstock	3,302	Torquay	7,903
Plympton St. Mary	2,815	Torrington	3,308
		Totnes	4,419

DEVONSHIRE, WM. SPENCER CAVENDISH, DUKE OF, lord-lieutenant of the county of Derby, and the princely owner of Chatsworth, was born in 1790. In 1811 he succeeded to the title and vast estates of the family. Although his grace never entered into the political contentions of the day, he was engaged in many public missions of great importance. In 1826 he was sent on a special embassy to Russia, as ambassador extraordinary at the coronation of the late Emperor Nicholas. His grace's retinue was of the most magnificent description, and incurred an expense of 50,000*l.* over the government allowance. During the following year, his grace was made a knight of the order of the garter, a privy councillor, and lord chamberlain of George IV.'s household. He was lord-lieutenant and custos rotulorum of Devonshire, high steward of Derby, president of the Horticultural Society, and chancellor of the University of London from 1836 to 1856. He died at his seat, Hardwick Hall, Derbyshire, in January 1858. Having never been married, his grace is succeeded in his great landed estates in Derbyshire and Yorkshire, and in the sister kingdom, by his nearest male kinsman, the Earl of Burlington, grandson of Lord George Cavendish (afterwards Earl of Burlington), son of William, fourth Duke of Devonshire.

DIACAN'THUS (Gr. δίς and ἄκανθα, a double spine), a genus of fishes, of the family *Cobitidæ*; the body is oval, and destitute of scales.

DIACOUS'TICS (Gr. διὰ and ἀκούω, to hear through a medium), that department of physical science which treats of the properties of sound reflected through different media.

DI'ALLAGE (Gr. διαλλαγὴ difference), a mineral of an emerald-green colour and pearly lustre, the Smaragdite of Saussure. It is found massive and disseminated, and has a foliated structure easily divisible in one direction. Its fractures exhibit a considerable difference in lustre and appearance; whence its name. Its constituents are silica, 50; alumina, 21; lime, 13; magnesia, 3; oxide of chrome, and oxide of iron, 13; and its specific gravity, 3·0.—*Diallogite*, is a mineral of the red-rose colour, with a vitreous lustre and a laminar structure. It is a carbonate of magnesia, mingled with carbonate of lime.

DIALS (v. 391; ix. 638). Among the ancient Greeks, the astronomers, Anaximander and Thales, are the first persons on record who taught the use of the sun-dial for denoting the hours of the day. Some, however, believe that the invention first

came from beyond the Euphrates, and the mention made of it in the Book of Tobit seems to confirm this opinion; while others think that the Phœnicians were the first inventors, and that the earliest traces of it are discoverable in what Homer says (Odyssey xv. 402) about the island of Syria, near Ortygia, where the Phœnicians are said to have noted the return of the sun to the solstices, and there left the monuments of their skill in astronomy; for we find that about 300 years afterwards Pherecydes erected a sun-dial, in the same island, to distinguish the hours. The dial of Ahaz (B.C. 700) has been mentioned; but of its formation there is nothing certain. The Greeks acknowledge that Anaximander first divided time by hours, and introduced sun-dials among them. This philosopher lived in the time of Cyrus the Great; and as he travelled in Chaldea, he might have brought from thence the dial and the needle, which were both in use there.

Previous to the year of Rome 460 there was no such thing as a sun-dial in that city, or any definite manner of marking the hours. Pliny himself tells us that no further observation of time was noticed in the twelve tables than the rising and setting of the sun. A contrivance was subsequently adopted for one of the consul's officers to make proclamation when the middle of the day was arrived; which he ascertained by watching when he could see the sun from the senate house between the rostra and the Græcostasis: By a similar observation he proclaimed the end of the day. S. Papirius Cursor erected the first dial in Rome, U.C. 460, on the temple of Quirinus. Pliny relates this on the authority of Fabius Vestalis; but he tells us, at the same time, that, according to Varro, M. Valerius Messala was the first introducer of sun-dials; he having brought one to Rome from Catania, and placed it on a column in the forum near the rostra, U.C. 491. The Romans were not sufficient astronomers at that day to be aware that a dial set for the meridian of Catania would not mark the hours accurately at Rome. For ninety-nine years no correction or alteration was made; but in 590 U.C., Q. Marcius Phillippus, who was then censor, had a proper one constructed, and placed near the other.

It is thus evident that the plane of every dial must represent the plane of some great circle upon the earth; and the gnomon, which points to the polar star, must represent the axis of the earth. Hence to construct a horizontal dial, agreeably to the principles and due elevations of the terrestrial globe, we must proceed thus. First elevate the pole to the latitude of the place where you may happen to be, and turn the globe till any particular meridian comes to the north point of the horizon, and the opposite meridian will cut the horizon in the south. Then set the hour index to the uppermost XII. on its circle, turn the globe westward till 15 degrees of the equator pass under the brazen meridian, and then the hour index will be at I.; and the first meridian will cut the horizon in the number of degrees from the north point, that is one distant from XII. Turn on till 15 more degrees of the equator pass under the meridian, and the hour index will be at XI., and the first meridian will cut the horizon in the number of degrees that XI. is distant from XII.; and so by making 15 degrees of the equator pass under the brazen meridian for every hour, the first meridian of the globe will cut the horizon in the distances of all the hours from XII. to VI., or 90 degrees.

Thus, to make an horizontal dial for the latitude of London, which is about 51° 30′ north, elevate the north pole of the globe 51½ degrees above the south point of the horizon, and then turn the globe until the first meridian (which is that of London on the English terrestrial globe) cuts the north point of the horizon, and set the hour index to XII. at noon. Then, turning the globe westward, till the index points successively to I., II., IV., V., VI., in the afternoon, or until 15, 30, 45, 60, 75, and 90 degrees of the equator pass under the brazen meridian, you will find the first meridian of the globe cuts the horizon in the following numbers of degrees from the south towards the east, viz. $11\frac{3}{4}$, $24\frac{1}{4}$, $38\frac{1}{12}$, $53\frac{1}{2}$, $71\frac{1}{12}$, and 90; the distances of the above hours from XII. on the plane of the horizon. To transfer these, and the rest of the hours, to a horizontal plane, draw the parallel right lines upon that place as far from each other as is equal to the thickness of the gnomon, and the space included between them will be the meridian or twelve o'clock line on the dial.

Dialling Lines, or *Scales*, are ingenious little implements used in the construction of dials. They consist of graduated lines placed on rulers or the edges of quadrants or other instruments. One is a double tangent (with a scale of six hours) or two lines of tangents, each of 45 degrees set together in the middle, and equal to the line of sines, with the declination set against the meridian altitudes in the latitude of the place. There is also a line of latitudes, fitted to the hour scale, and made according to the following formula. As the radius is to the chord of 90 degrees, so are the tangents of each respective degree of the line of latitudes, to the tangents of other arcs. The other kind of scales are particular, and give the several requisites for upright declining dials.

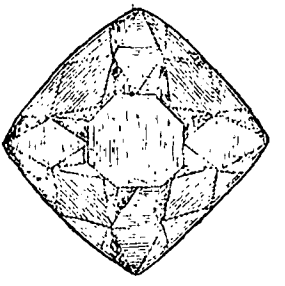
Dialling Sphere is another instrument for demonstrating the nature of spherical triangles, and conveying the true idea of drawing dials. It is constructed of brass, and has several semicircles sliding over each other on a moveable horizon.

DIAMONDS (v. 392). The history of diamonds, and their estimated values throughout the civilized world, present many interesting features. Among the ancients the earliest author known, who expressly notices these precious stones, is Theophrastus. It appears that the only diamonds used by them for setting, were those which, having been exposed to friction among the sands and stones in the beds of rivers, had acquired a slight polish and irregular facets. It does not appear that any diamonds have been found a Herculaneum or Pompeii; but we know that they were worn in rings at Rome, though merely as

oriental importations. The early Greek writers, however, describe them as found in Ethiopia, between the island of Meroe and the temple of Mercury, which is also affirmed by Pliny. But it is more likely that the ancient diamonds were all of Indian origin. We know that they were first brought into Europe from the East Indies; the earliest mine discovered being that of Sumbulpour, on the river Goual, which flows into the Ganges. But the chain of mountains in the kingdom of Golconda has produced the greatest quantity. Among these, one of the weight of 193 carats, or 32 dwts., was discovered, for which Count Orloff gave 104,166*l.*, and presented it, in 1772, to the Empress Catherine II. of Russia, as a birth-day present. Among the crown jewels of Russia is an oriental diamond, called the Sceptre, which is the size of a pigeon's egg, and weighs 779 carats. It was formerly the eye of a Brahminical idol, whence it was stolen by a French soldier, and after passing through several hands, was purchased by the Empress Catherine for 90,000*l.* and an annuity of 4000*l.*

The colebrated 'Koh-i-noor' diamond, now in the possession of Queen Victoria, was originally dug up from the diamond mines of Golconda. At the same time another one of equal value was discovered, called the 'Koh-i-toor.' What has become of the latter one is unknown; but the Koh-i-noor, after passing through a variety of political and other adventures, at length passed from the hands of the Mogul princes into the possession of the British sovereign; while the Koh-i-toor is supposed to be still retained by some of the family of the late royal house of Delhi. When the Koh-i-noor diamond was exhibited at the Great Exhibition of 1851, it was a subject of remark that it did not reflect the dazzling brilliancy that might have been expected from so precious a gem; and therefore it was subsequently determined, after much consultation, to re-grind its surface. But so extremely hard is the diamond, that nothing will fairly cut it but some of its own dust; and to effect the above object, a small steam engine had to be erected. The diamond was then imbedded in a mass of solder, when that part only was exposed which was to be operated upon. To this was applied a metal wheel revolving at the rapid rate of about 2000 times in a minute, which, with the aid of diamond dust, gradually wore away the exposed substance of the brilliant, and produced a new facet. The great object was to remove a flaw, which had been discovered in the Koh-i-noor, and to give it new brilliancy, without grinding away much of its substance. So difficult an operation was it considered, that two workmen had to be brought over from Holland, where the greater portion of the diamonds sold in Europe are cut.

Among the most celebrated diamonds, obtained from the East, is that known as the Pitt diamond, which received its name from Thos. Pitt, Esq., governor of Fort St. George, in the East Indies, and grandfather of the celebrated Earl of Chatham. It weighed 127 carats, and at the time he made the purchase it was considered the largest and most beautiful brilliant in Europe. He gave 20,400*l.* for it. When polished, it was as big as a pullet's egg; and the cuttings amounted to upwards of 8000*l.* It was sold to the king of France for 200,000*l.*, and, under the name of the Regency diamond, formed the principal ornament of the French crown before the revolution. The annexed is a representation.



THE PITT DIAMOND.

At the beginning of the eighteenth century it was discovered that diamonds were found in some branches of the river das Caravillas, and at Serro de Trio, in the province of Mino Geraes, in the Brazils, belonging to Portugal. The Rio Janeiro fleet brought home at once 1146 ounces of them. Such a considerable supply would have reduced the value of diamonds, had not the government of Portugal laid restrictions on the persons who searched for them. In 1741 a diamond was brought from the Brazils, about as large as a turkey's egg, which weighed 17 ounces. In 1766, after it had been cut, it was found to weigh 1680 carats, or 12½ ounces, and its estimated value was 5,644,800*l.* Another diamond, said to be in the possession of the Braganza family, has been valued at 3,698,000*l.*

At a lecture delivered at the Birmingham Philosophical Society in 1815, a very interesting account of diamonds was given. It was then stated that the number of known diamonds, of 36 carats and upwards, was not more than nineteen, two only of which were in England, the Pigot diamond, weighing 45 carats, and worth 16,200*l.*, and one in the possession of the Hornby family, weighing 36 carats, and valued at 8000*l.* France had two, one of which was the celebrated Regency or Pitt diamond just mentioned. Germany had one weighing 139½ carats, and worth 155,682*l.* Holland had but one, which weighed 36 carats, and was estimated at 10,368*l.* Russia was rich in diamonds—the largest being that of the Sceptre, already noticed. Another of the Russian diamonds was estimated at 369,800*l.* The then Great Mogul was stated to be in possession of a rose-coloured diamond, valued at 622,728*l.* Persia possesses a great number of diamonds, one of which, the 'Mountain of Splendour,' is estimated at 145,000*l.*; and another, the 'Sea of Glory,' at 34,848*l.*

The crown diamonds of England, many of which are exhibited in the Tower of London, and constitute the regalia of the British sovereigns, are of immense value. Some time ago, a dispute

was pending between the Queen of England and the King of Hanover, as to the right to a certain portion of the jewels in the possession of the British crown, estimated to be worth a considerable sum. It appeared that these diamonds had been left by George II. and Charlotte, queen of George III., to the royal family of Hanover. The disputed claim, which had been of a very protracted nature, was at length submitted to a commission, consisting of three judges of the highest eminence, who, after a long investigation, decided that the Hanoverian claim was just, and accordingly reported in its favour; so that the British crown has been doomed to the loss of a portion of its regalia. The diamonds and other jewels of the Crown of State, which Queen Victoria wore at the marriage of her daughter to Prince Frederick of Prussia in January 1858, have been estimated as follows:—Twenty diamonds round the circle of the crown (1500*l.* each), 30,000*l.*; two large centre diamonds (2000*l.* each), 4000*l.*; four crosses, each composed of twenty-five diamonds, 12,000*l.*; four large diamonds on the top of the crosses, 40,000*l.*; twenty-six diamonds contained in the fleur-de-lis, 12,000*l.*; diamonds and pearls in the arches and crosses of the crown, 14,000*l.*; the great ruby, 10,000*l.*; and the *Agua Marina*, 12,000*l.*; total 134,000*l.*; the entire weight of the crown being only 19 oz. 10 dwts.

Diamonds are usually found in the rough, as it is called; and there is some difference in the silicious crust which envelopes them. Those brought from Brazil have a thicker incrustation than those from the East Indies; and hence they are easily distinguished in their natural state; but as the most skilful lapidaries may be deceived in them after they are cut, they are considered of equal value in trade. This equality, however, is only to be understood of the small ones, as most of the occidental diamonds, beyond four or five carats, have blemishes, which are seldom found in the oriental, and in that case the difference is great. The first water in diamonds means the greatest purity and perfection of their complexion, which ought to be that of the purest water. When diamonds fall short of this perfection, they are said to be of the second or third water, &c., till the stone may be properly called a coloured one; for it would be impropriety to speak of an imperfectly-coloured diamond, or one that has other defects, as a stone of a bad water only. For the valuation of diamonds of all weights Mr. Jeffries lays down the following rule. He first supposes the value of a rough diamond to be set at 2*l.* per carat, at a medium; then to fix the value of diamonds of greater weights multiply the square of their weight by two, and the product is the value required: *e.g.* To find the value of a rough diamond of two carats: $2 \times 2 = 4$, the square of the weight, which multiplied by two gives 8*l.*, the true value of a rough diamond of two carats. For finding the value of polished diamonds, he supposes half their weight to be lost in manufacturing; and therefore to find their value we must multiply the square of double their weight by two, which will give their true value in pounds. Thus, to find the value of a wrought diamond weighing two carats we first find the square of double the weight $4 \times 4 = 16$, then $16 \times 2 = 32$. So that the true value of a wrought diamond of two carats is 32*l.* On these principles Mr. Jeffries constructed tables of the price of diamonds from one to 100 carats.

That the diamond is pure carbon has been tested in various ways, and has often called forth the attention of the scientific artists. In the infant stage of the first French revolution, M. Clouet communicated to the National Institute the result of an experiment made through the agency of steel-filings. A small diamond was selected, and wedged with iron-filings into an iron crucible of definite weight, the ratio between the weight of the diamond and that of the iron having been previously determined on. The iron crucible was placed in a second crucible of Hessian earth; this in a third crucible of the same substance (with a layer of silicious sand between the two); and this in a highly-heated furnace. After an hour's heating, the diamond and the iron were found to have disappeared, and a globule of steel to have been formed from them, the weight of which wanted only a few grains of that of the ingredients conjointly.

DIANA, TREE OF, a term applied to the crystallized silver which becomes separated when mercury is put into a solution of the nitrate of silver. In Ozanam's 'Recreations of Philosophy,' we find two processes mentioned for producing this arborescent appearance—the one by Lemery, and the other by Homberg. [ARBOR DIANÆ, and ARBOR MARTIS, *Suppl.*]

DIANEL'LA, a genus of plants, of the natural order *Siliaceæ*. They chiefly consist of the Australian tuberous-rooted perennial herbs, with blue flowers.

DIASTOP'ORA (Gr. διάστημι to separate, and πόρος a pore), a genus of Corallines, of the sub-class *Polypiaria Membranacea*. The cells are tubular, with rounded openings irregularly disposed in vertical rows.

DIATOMA'CEÆ (Gr. διὰ through, and τομὴ a division), an order of *Algæ*, very minute in their structures, and consisting of fragmentary crystalline bodies, usually bounded by right lines. Dr. Lindley has thus described them:—'They seem to form the extreme limits of the vegetable and animal kingdoms. Their regular form, and the power of separating into distinct particles, which most of them have, are almost as much the attributes of the minerals as of the animal or vegetable kingdom.'

DIAZENE'TIC (Gr. διαζεύγνυμι to separate), a term applied, in ancient Greek music, to the tone disjoining two-fourths; when combined with either one or the other it made a fifth.

DIAZO'MA (Gr. διὰ, and ζῶμα a cincture), in zoology, a genus of *Acidia*, in which the species appear circularly or in rays, and are imbedded in a horizontal gelatinous mass. It is also a term applied, in ancient architecture, to the resting-places, which, like bands, encircled the Roman amphitheatres at different heights.

DIBDIN, REV. DR. T.F., F.R.S., and F.S.A., a distinguished bibliographer, and nephew of the

celebrated song-writer, Charles Dibdin, was born in 1776. He was matriculated at Oxford, as a commoner of St. John's; and at college his taste for literature and history early commenced. He first turned his attention to the bar as a profession; but soon renounced this pursuit, and directed his views to the church. He was ordained in 1804. Having obtained the preachership of Brompton Chapel in 1811, and some other minor preferments, he directed his attention to authorship; and he describes his 'first literary engagement' as that of conducting a weekly journal, called 'The Quiz,' to which Sir Robert Ker Porter, and his clever sisters, were contributors, and in which Mr. Dibdin undertook to furnish the pieces connected with antiquity and art. He also edited a history of Cheltenham, in 1802, for Mr. Ruff, a bookseller. The same person printed the first edition of his 'Introduction to the Knowledge of Rare and Valuable editions of the Greek and Latin Classics,' published in 1802; which was so successful, that a second edition was required in 1804, and a third in 1808. The last was dedicated to Earl Spencer, to whom the first edition had been the means of introducing him. He afterwards engaged in the composition of a series of lectures, 'On the Rise and Progress of English Literature,' which were delivered at the Royal Institution in the years 1806, 1807, and 1808. In 1807 he undertook the editorship of a weekly journal, entitled 'The Director,' of which Mr. Bernard, the principal manager of the Royal Institution, was the proprietor. Mr. Dibdin wrote several essays, and a description of the principal pictures exhibited for sale. His 'Bibliographiana' may be considered as the germ of the 'Bibliomania,' a work which tended to establish the author's reputation in his peculiar branch of research. He next embarked on one of his most extensive works, and that which, if completed, would have been the most important, 'The Typographical Antiquities of Great Britain.'

The formation of the Roxburghe Club, at this period, originated in the sale of the Duke of Roxburghe's library, in June 1812. On this subject Dr. Dibdin has discoursed at length in his 'Bibliographical Decameron,' and also in a long chapter of Roxburghiana, in his 'Literary Reminiscences.' Dr. Dibdin was the Vice-President, and Lord Spencer the President. His work, entitled 'Bibliotheca Spenceriana,' was published in four volumes super-royal octavo, all the copies of which were sold, the small copies at 8*l.* 8*s.*, and 9*l.*.9*s.*, and the large paper at 18*l.* 18*s.* Dr. Dibdin's great work, 'The Bibliographical Decameron' appeared in three volumes in Dec. 1817. The author's expenses on this magnificent work amounted to nearly 5000*l.*; but he sold the whole impression of 18 large paper copies, and 760 small ones (many of the latter at the advanced price of nine guineas, the subscription having been seven guineas and a half); and the result was not only very triumphant, but probably more profitable than in the case of any other of our author's productions.

On the completion of his 'Decameron,' our author undertook a description of the mansion of his patron, Earl Spencer, at Althorp, in Northamptonshire, with all its literary and artistic treasures. It was brought out in 1822, under the title of 'Ædes Althorpianæ,' the engravings of which cost 2000*l.*

In 1821 Dr. Dibdin published the result of his continental travels, under the title of 'A Bibliographical, Antiquarian, and Picturesque Tour.' The sums paid to engravers amounted to nearly 5000*l.* At this time he became involved in pecuniary difficulties. But at length he obtained, through the friendship of Earl Spencer, the vicarage of Ecning, near Newmarket, and afterwards the rectory of St. Mary's, Bryanston Square. About this time he published numerous sermons, and other works of minor importance. In 1836 appeared the most amusing of all his productions, his 'Reminiscences of a Literary Life,' from which these notices are chiefly gleaned. His last work of any importance was his 'Bibliographical, Antiquarian, and Picturesque Tour in the Northern Counties of England and Scotland,' which was published in 1838. He died in 1847.

DIBO'LIA, a genus of coleopterous insects, of the family *Cyclica*.

DIBOTH'RIANS (Gr. δὶς twice, and βόθριον a pit), a kind of tapeworms, of the family *Bothriocephala*.—*Dibothryorhyncus* is also a genus of Entozoa.

DIBRAN'CHIA (Gr. δὶς two, and βράγχια gills), a division of Cirripedes, which have their respiratory organs in two leaf-like branches.—*Dibranchiates* are an order of the Cephalopods, which are furnished with two gills, and a peculiar apparatus for secreting and discharging an inky fluid.

DIC'ERATES (Gr. *double-horned*), a division of Mollusca, comprehending Gasteropods, which have the head furnished with two tentacula.

DICER'MA (Gr. *double-propped*), a genus of leguminous plants, of the sub-order *Papilionaceæ*, consisting of shrubs with yellow flowers and trifoliate leaves.

DIC'EROS (Gr. *double-horned*), a genus of lizards, of the Chamelion family.

DICHÆ'TÆ, a sub-division of apterous insects, consisting of two families, the *Pupipara*, and the *Athericera*, both of which have two setæ to the proboscis.

DICHE'LES (Gr. *double-lipped*), a genus of coleopterous insects, of the family *Siphonostoma*.

DICHELES'TIUM, a genus of Crustaceans, with narrow elongated bodies, of the family *Siphonostoma*.

DICH'OBUNE, a genus of small fossil quadrupeds, which occur in the tertiary rocks, near Paris.

DICHOTOMA'RIA (Gr. διχότομος, divided into two parts), a genus of membraneous corallines.

DICLIDAN'THERA (Gr. *double-valved anthers*), a genus of plants of the natural order *Ebenaciæ*, consisting of small shrubs or trees, with pendulous branches, natives of Brazil.

DICOL'OPHUS (Gr. *double-crested*), a genus of Grallæ, or wading-birds, which are furnished

with a tuft of feathers on the head spreading different ways, whence the name has been derived.

DIC'OTYLES, a genus of Peccaries, or hogs, which have no tail, and are without any external toe on the hinder feet.

DICRA'NIA (Gr. *double-pronged*), a genus of coleopterous insects, of the family *Lamellicornes*, natives of Brazil.

DICRANOCE'RUS (Gr. *double-forked horn*), a genus of the Antelope family, with forking horns and a short tail.

DICRANOU'RA (Gr. *double-forked tail*), a genus of lepidopterous insects of the family *Nocturna*.

DIC'ROITE (Gr. *two-coloured*), a mineral of a lustrous blue colour, found in gneiss and granite, and consisting of silica, 50; alumina, 30; magnesia, 11; oxide of iron, 5; with slight traces of manganese.

DICRURI'NÆ (Gr. *forked tails*), in zoology, the Drongo Shrikes, of which the *Dicrurus* is the type; flies are their principal food.

DICTYOP'TERA (Gr. δίκτυον a net, and πτερὸν a wing), a genus of coleopterous insects, of the tribe *Cerbrionidæ*, and belonging to the section *Malacodermi*.

DICTYOT'IDÆ (Gr. δίκτυον a net, and οὖς an ear), in botany a tribe of fuci, of which the *Dictyota* is the type.

DIDEL'PHYS (Gr. *double-wombed*), a genus of Marsupial Mammalia, possessed of an abdominal pouch, in which the fetus is placed soon after gestation, and there nourished, until it obtains sufficient strength to walk forth. The kangaroo and the opossum are types of the Marsupial family of *Didelphidæ*. [MARSUPIALIA.]

DIES FESTI, festival days among the ancient Romans, which were of three descriptions—*dies festi*, *profesti*, and *intercisi*. The *dies festi* were consecrated to the gods, and set apart for the celebration of *sacrifices*, *epulæ*, *ludi*, and *feriæ*. The *dies profesti* were divided into *fasti*, *comitiales*, *comperendini*, *stati*, and *præclares*. The *dies intercisi* were partly holidays and partly days of business; *i. e.* one-half of the day was employed in sacrifice, and the other in the administration of justice. Some of these days were *fasti* in the morning, and *nefasti* in the afternoon. The Roman days were also divided into fortunate and unfortunate. The *dies postridiani*, or the days next after the Calends, Nones, and Ides, were reckoned unlucky, and therefore called *atri dies*. (Nuttall's *Class. Dict.*)

DIE'SIS, in ancient music, the division of a tone in a major and minor semi-tone.

DIFFERENCE (v. 411), in military matters, a term used for the sums paid by officers when exchanging from half to full pay. It is also the price or difference in value of the several commissions. When officers exchanging to half pay receive the difference, it is the regulation that they must repay it on returning to full pay; and that their widows are not entitled to pensions in case of their decease.

DIFFLU'GIA (Lat. *diffluere* to spread abroad), in zoology, a genus of the *Polyparia dubia*, inhabitants of fresh water, with a body small, gelatinous, and contractile.

DIGESTIVES (Lat. *digero* to dissolve), substances employed in medical science for the inducement or promotion of suppuration, when applied to wounds or ulcers. They are chiefly used in the form of ointments.

DIG'IT, in astronomy, the twelfth part of the diameter of the sun or moon, and a term in general use for expressing the magnitude and quantity of an eclipse. Thus, when six of these parts are concealed, the eclipse is said to be of six digits.

DIGITAL'INA, a vegetable alkali, obtained from *Digitalis purpurea*. Its medical properties are similar to those of the Digitalis, or foxglove. Like other alkalies it has the property of restoring the blue colour *of litmus*, which has been reddened.

DIGLOBIC'ERUS (Gr. *double-globed horns*), a genus of coleopterous insects, of the tribe *Cerbrionites*, and so called from two of the ten joints of their antennæ being large and globular.

DIL'IGROUT, in the feudal ages, a kind of royal pottage made for the king's table on his coronation day. There was a tenure in serjeanty, by which lands were held of the king, by the service of finding this pottage at that great solemnity.

DILU'VIAL ACTION is one of the problems in geological science which has yet to be clearly solved. This action has doubtless been the cause of those upper formations of the earth's crust, known as DILUVIAL (v. 424); and it is generally imagined that the deposition of organic remains in the solid strata is attributable to a universal deluge; but this opinion must be erroneous; for it is evident that the different beds which form the earth's crust have been produced at different times, after a long succession of ages between each formation; 'yet it is not improbable,' says Higgins, 'that after the formation of all these beds, the earth was overwhelmed by water; or, according to some a succession of deluges passed over the surface. The effects of this diluvian action may be considered under the following heads:—the destruction of the pre-existing rocks, and deposition of gravel; the transport of large stones from their parent beds; the formation of caves, and the scooping out of valleys.' [DEPOSITION, BOULDERS, CAVES, DENUDATION, *Supplt.*]

DIMOCAR'PUS, a genus of fruit trees, of the order *Cæsalpinieæ*, and natives of China. The fruit is a red berry, disposed like the grape in bunches, but larger than the grape.

DIMYA'RIA (Gr. δὶς and μυὼν, double muscles), a term applied to those bivalvular mollusca, which are furnished with two abductor muscles; those having only one muscle being termed *Monomyaria*. It is thus the class Conchifera is formed into two orders.

DIOC'TRIA, a genus of dipterous insects, of the family *Tanystoma*.

DI'ODON, a genus of cheliform fishes, of the family *Balistidæ*, and order *Plectonathes*; the body being nearly orbicular, and covered with spines, and the jaws without teeth.

DIOME'DIA, a genus of web-footed birds, the Albatross, the extremities of whose wings measure about 12 or 14 feet. Its food consists of fishes and other marine animals.

DIOP'SIDE (Gr. *διοπτις* transparent), a shining mineral, generally striated, which occurs in pale-green prismatic crystals. Its constituents have been found to be silica, 57·50; lime, 16·50; magnesia, 18·50; oxide of iron and manganese, 6·00.

DI'ORITE (Gr. *διαιρέω* to separate, from the distinctness of the component parts), in geology, a variety of green stone, which differs little from the sienite. It contains a large proportion of augite of hornblende; the former being an earthy mineral, of a greenish tint. The block of stone, out of which the head of Memnon in the British Museum was sculptured, exhibits a specimen of sienite passing into diorite, or green stone, in the same mass.

DIOS'PUROS (Gr. *divine wheat*), a genus of plants, the *Granum Jovis* of Pliny, or the Date Plum, consisting of shrubs and trees, with pale yellow flowers, and the fruit a globose berry.

DIPLOP'TERA (Gr. *double-winged*), a division of the stinging Hymenopterous insects, consisting of those wasps which have the upper wings folded and doubled up longitudinally when at rest. (Craig.)

DIPLOP'TERON (Gr. *double-winged*), a genus of fishes, of the family *Percidæ*, with small scales, and the dorsal fins united at the base; the pectorals being shorter than the ventrals.

DIP'TERYX ODORA'TA (Gr. *δις* twofold, and *πτέρυξ* a wing), an ornamental tree of Guiana, of the natural order *Leguminosæ*, the fruit of which is the fragrant Tonkin bean, so extensively employed in the perfuming of snuff. This bean contains a fragrant crystalline substance known as *coumarin*, which alcohol readily extracts. On evaporating the alcoholic solution, the substance is obtained in a solid state, and possesses an agreeable aromatic odour.

DIP'TERUS (Gr. *δις* and *πτέρυξ*, double-winged), a genus of fossil fishes from the old sandstone formation. It was first brought into notice by Professor Sedgwick and Mr. Murchison.

DI SALTO, in music, a motion by skips and not by degrees; as when a melody omits one or more degrees, it is said to proceed *di Salto*, or by skips.

DISCAD'OMA (Gr. *δισκος* a disk, and *δομὴ* a structure), a genus of mollusca, of the family *Helicidæ*, the shell of which has the aperture angulated. It belongs to the *Lucerninæ*, or land volutes.

DISCHARGE, in military matters, the dismissing of a soldier from his regiment, either on account of long services, or for personal disabilities. The discharge of a soldier is determined on by a regimental board, consisting of the major or second in command, and two captains after they have duly considered the claims of the soldier, and verified the facts of his statements. Soldiers are now permitted to obtain free discharges after serving twelve years; and for every year of actual service beyond that period they receive a gratuity. They are also permitted to purchase their discharges, according to a scale which is regulated by the number of years they have served.

DISCOPLEU'RA (Gr. *δισκος* a disk, and *πλευρὰ* a rib), a genus of umbelliferous plants, with white flowers, of the sub-order *Orthospermæ*. They are natives of North America, and so called from the two lateral nerves of the fruit forming a disk on each side of it.

DISCOS'OMA (Gr. *δισκος* a disk, and *σῶμα* the body), in zoology, a genus of the *Acalephæ*, of the order *Carnosi*. It is of the discoid form with very short tentacula.

DISCOVERY, SPIRIT OF. The last half century has witnessed more discoveries, tending to the benefit of mankind, and the civilization of the human race, than any period of the same duration in the history of the world. In mechanism and agriculture,—in chemistry and physical science,—in the application of steam and electricity,—in navigation and the general extension of the useful arts,—the most wonderful discoveries have been effected, and everywhere applied to the general benefit and improvement of the human family. Thus steam and mechanics have increased productions, and afforded the means of accomplishing an almost illimitable amount of labour. Agricultural chemistry has enlarged the domain of knowledge in that most useful and important department of scientific discovery. What, indeed, was the state of the arts and of society in 1800, compared with the present period? Gas-light was then unknown; but now every city and town of any pretence is lighted with it, and we have the announcement of a still greater discovery, by which light, heat, and motive power may all be produced from water, with scarcely any cost. Voltaism was discovered in 1800; the electro-magnet in 1821. Electrotyping was discovered only a few years ago. In 1800 it required ten or twelve days to convey intelligence between London and Edinburgh. Now it can be accomplished in a few minutes by the electric telegraph, which only had its beginning in 1843. It now traverses the vast expanse of ocean, and is uniting the whole world in one great family. In 1839 Daguerre communicated to the world his beautiful invention, which has since been so wonderfully improved by the photographic process. Gun cotton, with its explosive qualities; chlorofrom, with its medical appliances; and the lucifer-match, with its domestic conveniences, are discoveries but a few years old. Before the year 1800 there was not a single steamboat in existence, and the application of steam to machinery was unknown. Fulton launched the first steamboat in 1807. Now the ocean and the rivers of nearly every country are traversed by steamboats. In 1800 there was not a single railway in the world. Now, in 1858, there are above 22,000 miles of railroad in England and the United States. In the latter alone there are 8797 miles. In 1800 it took as many days to travel a given distance as can now be accomplished in as many hours.

The spirit of discovery has not even been limited to the confines of earth, but has soared into the sublimer regions of science, and, through

the powers of the telescope, has penetrated the vast boundaries of ethereal space, and brought to light a number of planetary orbs revolving in our solar system, which were entirely unknown to our ancestors previous to the present half-century. [PLANETS, *Supplt.*]

DISCU'TIENTS (Lat. *discutio* to shake in pieces), substances possessing the property of dispelling or resolving tumours. They are usually employed in the form of lineament or ointment.

DISINFECTANTS, a term applied to certain chemical agents possessing the power of destroying offensive effluvia, and consequently considered by many to be efficacious in the destruction of miasmata. Charcoal is an excellent disinfectant, absorbing putrescent effluvia.—Chlorine and the hypochlorites destroy offensive odours, and decompose sulphuretted hydrogen, hydrosulphuret of ammonia, ammonia, &c. The disinfecting liquid of Labarraque consists of a solution of hypochlorite of soda. Nitrous acid acts by its oxidizing agency, and sulphurous acid by its deoxidizing properties. Several metallic salts have been found efficacious in decomposing sulphuretted hydrogen and hydrosulphuret of ammonia, forming sulphurets of the different metals which are destitute of odour, and insoluble. They also combine with animal matter, and retard putrefaction.

'Burnett's disinfecting liquid' is a solution of chloride of zinc. Nitrate of lead constitutes 'Ledoyen's'—and a solution of a persalt of iron is said to constitute 'Ellerman's de-odorizing fluid.' The late Dr. Henry, in the 'Philosophical Magazine and Annals of Philosophy,' for January 1832 (vol. xi. pp. 22 and 205), has apparently shown that a temperature of 200° Fahrenheit acts as a disinfecting agent, and dissipates or destroys the infectious matter of certain diseases, as scarlatina; and he suggested this method of effecting the purification of infected clothing; as he found that neither the colour nor texture of piece-goods and other articles of clothing was injured by a temperature of 250° Fahrenheit. The late Dr. Pereira considered 'ventilation' to be the most important disinfecting process.

DISMISSAL, in military affairs, the discarding of a soldier from the British service. There are two modes of dismissal—the one specific, and the other general. When an officer is dismissed specifically; it is implied that he is rendered incapable of ever serving again in the army. This species of dismissal is usually attended with public marks of degradation or disgrace; and when it is the result of a court-martial, the party is said to be *cashiered*. When an officer is dismissed generally, it is by a simple intimation that the sovereign has no further need of his services, the dismissal of a soldier, without explanation or trial, being a part of the royal prerogative, as in the case of General Sir Robert Wilson, who was suddenly dismissed by George IV., for his presumed interference with the funeral procession of Queen Caroline.

DISPENSARIES (v. 454). These important institutions did not begin to be established in their present form until the latter part of the eighteenth century. The first one was the Royal General Dispensary, in St. Bartholomew's Close, Smithfield, which was founded in 1770. The Westminster Dispensary, in Gerard Street, Soho, founded in 1774, was the next; the London Dispensary, Spitalfields, was founded in 1777; the Surrey, Great Dover Street, in the same year; after which, dispensaries were rapidly established in all the populous parts of the metropolis; and they still continue to increase in number with the ever-extending population. Every portion of the metropolis and many of the suburban districts have their public dispensaries, amounting to about 60 in all. Some of these are on a large scale, such as the Royal General, relieving 10,000 persons annually; the St. George's and St. James', 10,500; the City, 13,700; the Western, in Lisson Grove, 13,800; Holloway and North Islington, 8200. Others are on a lower scale; but the total number of persons receiving advice or medicines from the forty-two general dispensaries is about 212,800 each year. The eighteen special dispensaries return 21,860 as the number of patients attended. Of the special dispensaries five are for attending lying-in cases, including the Royal Maternity Charity founded in 1757, two for diseases of the eye; two for ear diseases; and three for ruptures, or truss societies; two for consumption and chest diseases; and the rest for various special maladies.

A late report of the Statistical Society gives a series of complete returns from all the Dispensaries and Hospitals in London. From these it appears that upwards of a million of money is spent in the metropolis alone in the administration of medical relief; and that nearly 700,000 persons receive gratuitous medical assistance.

D'ISRAELI, ISAAC, D.C.L., F.S.A., &c., the celebrated literary historian, and father of the Right Hon. Benjamin D'Israeli, was born at Enfield in 1766. He received the greater portion of his education at Amsterdam and Leyden, where he acquired a knowledge of several modern languages. On his return to England he soon displayed his predilections for that department of literary criticism which has distinguished his name. His early aspirations, however, were directed to poetry and novel writing, of which he published numerous specimens; among others, 'A Defence of Poetry,' 'Vanrien, a Satirical Novel,' 'Flim Flams, or the Life of My Uncle,' 'Despotism, or the Fall of the Jesuits,' &c. In 1791 he brought out his first volume of the 'Curiosities of Literature; consisting of Anecdotes, Characters, Sketches, and Observations, Literary, Critical, and Historical.' The 'Curiosities' were gradually increased to three volumes; and a second series was published in 1823. They were remodelled and improved in various editions, and reached their twelfth impression in the year 1841. In 1795 he published his 'Essay on the Manners and Genius of the Literary Character;' in 1796, 'Miscellanies, or Literary Recreations;' in 1812 and 1813, his 'Calamities of Authors, including some inquiries respecting their Moral and Literary Characters;' in 1814, 'Quarrels of Authors; or, some Memoirs for our Literary History; including Specimens of Controversy, to the Reign of Elizabeth.' In 1816 appeared his 'Inquiry into the Literary and Po-

litical Character of *King James I.* On these works, and more particularly 'The Curiosities of Literature,' will rest Mr. D'Israeli's most enduring reputation; but he derived more temporary popularity from his 'Commentaries on the Life and Reign of Charles I.' For this production the University of Oxford conferred upon him the honorary degree of D.C.L., as a testimony of their respect. In 1839 he was stricken with blindness. Nevertheless, with the aid of his daughter, he gave the world some notices of the early period of our literary history, under the title of 'Amenities of Literature.'

Mr. D'Israeli was for many years the intimate friend and principal literary adviser of the late Mr. John Murray, of Albemarle Street, whose father was the publisher of some of our author's earliest productions. Mr. D'Israeli was a contributor to the early numbers of the 'Quarterly Review.' His review of 'Spencer's Anecdotes' in 1820, and a vindication both of the moral and poetical character of Pope, produced the famous Pope controversy, in which Mr. Bowles, Lord Byron, and others took part. He died in 1848.

DISSEI'SIN, the unlawful ejecting or ousting of any person, who is seised of the freehold in lands, either by entry or actual dispossession of the freehold. Thus Blackstone, in speaking of the several stages or degrees requisite to form a complete title to lands and tenements, mentions *disseisin* as being the lowest and most imperfect, because it consists of the mere naked possession, or actual occupation of an estate, without any apparent right to hold and continue such possession. 'This may happen,' says this learned commentator, 'when one man invades the possession of another, and, by force or surprise, turns him out of the occupation of his lands; which is termed a *disseisin*, being a deprivation of that actual seisin, or corporal freehold of the lands, which the tenant before enjoyed. Or it may happen, that after the death of the ancestor, and before the entry of the heir, or after the death of a particular tenant, and before the entry of him in remainder or reversion, a stranger may contrive to get possession of the vacant land, and hold out him that had a right to enter. In all which cases, the wrong-doer has only a mere naked possession, which the rightful owner may put an end to by a variety of legal remedies. But, in the meantime, till some act be done by the rightful owner to divest this possession, and assert his title, such actual possession is, *primâ facie*, evidence of a legal title in the possessor; and it may, by length of time, and negligence of him who hath the right, gradually ripen into a perfect and indefeasible title.'

The above strictly applies to what is called 'disseisin of things corporeal,' or the wrong possession of houses, lands, &c.; but there is another kind of tenure, of rather an abstract nature, called 'disseisin of incorporeal hereditament,' or contingent annuities, in which there cannot be an actual dispossession, as the object of contention is neither liable to actual bodily possession nor dispossession; but is only at the choice of the party injured, if, for the sake of more readily trying the right, he is pleased to consider himself as disseised.

DISSENTERS, PROTESTANT, &c. (v. 455.) During the present century the progress of Dissent has been rapid in every part of the United Kingdom. According to the census of 1851, there were then numbered in 'England and Wales 36 different religious communities or sects—27 native or indigenous, and 9 foreign,' besides a number of small isolated congregations, not sufficiently organized or numerous to constitute a sect. The following is a tabular summary of different religious denominations, including the English and Scotch establishments, Romish church, &c.; and specifying the number of places of worship belonging to each:—

	Places of Worship.
Church of England	14,077
Scottish Presbyterians:—	
Church of Scotland	18
United Presbyterian Church	66
Presbyterian Church in England	76
Reformed Irish Presbyterians	1
Independents	3,244
Baptists:—	
General	93
Particular	1,947
Seventh Day	2
Scotch	15
New Connection General	182
Undefined	550
Society of Friends	371
Wesleyan Methodists:—	
Original Connection	6,579
New Connection	297
Primitive Methodists	2,871
Bible Christians	482
Wesleyan Methodist Association	419
Independent Methodists	20
Wesleyan Reformers	339
Unitarians	229
Moravians	32
Calvinistic Methodists:—	
Welsh Calvinistic Methodists	828
Lady Huntingdon's Connection	109
Sandemanians	6
New Church	50
Brethren	132
Isolated Congregations	539
Lutherans	6
French Protestants	3
Reformed Church of the Netherlands:—	
German Protestant Reformers	1
Roman Catholics	570
Greek Church	3
German Catholics	1
Italian Reformers	1
Catholic and Apostolic Church	32
Latter Day Saints	222
Jews	53
Total	34,467

Religious bodies not classed with these, and yet having peculiar doctrines, and distinct enough to have names, are the Supralapsarian Calvinists, Huntingdonians, Universalists, Millenarians, Predestinarians, Trinitarian Predestinarians, Chris-

tians, Christian Association, Orthodox Christians, New Christians, Christ's Disciples, Primitive Christians, New Testament Christians, Original Christians, United Christians, Gospel Pilgrims, Free Gospel Christians, Believers, Non-Sectarians, No particular Denomination, Evangelists, Gospel Refugees, Free-thinking Christians, Protestant Christians, Evangelical Protestants, Protestant Free Church, Trinitarians, Protestant Dissenters, Dissenters, Evangelical Dissenters, Episcopalian Seceders, Free Church, Teetotallers (who are classed as a sect), Doubtful, Benevolent Methodists, General, Israelites, Christian Israelites, Stephenites, Inghamites, Temperance Wesleyans, Temperance Christians, Freethinkers, Rational Progressionists, Southcottians (four congregations).

From the preceding list, it will be at once perceived how extended have been the almost silent changes which have taken place in less than a century. From each new sect several others have emanated. Thus there are six denominations of Baptists; and already, within sixty years of John Wesley's death, numerous branches of Methodism have sprung into existence.

DIS'TOMA (Gr. *double-mouthed*), a genus of intestinal worms, so called from their two suckers or organs of adhesion; the one being the anterior or true mouth, and the other posterior, on the ventral aspect of the body.

DISTRIBUTION, a word of extensive importance both in political economy and physical science. As applied to the former, it comprehends those great social principles by which the products of industry—the necessaries and luxuries of life—are diffused through the whole community. If the laws of distribution are not duly carried into operation, we must, with all our superabundance of national wealth, necessarily become, on the one part, a class of unproductive idlers rolling in affluence, and on the other, a race of degraded paupers; —the two classes thus assimilating to the *patroni* and *clientes* of the Romans, when the old republican virtues had become extinct. But in order to carry the laws of distribution into full effect, useful labour, profitably employed, is the great essential. Food, shelter, and raiment, which are all produced by industry, are the three first requisites. The natural wants of society, when in a healthy state, will aid in distributing the products of labour. The first object of industry is the cultivation of the soil, by which the food of man is supplied. The next is the erection of domiciles, and the manufacture of household furniture, for protecting us from the inclemency of the seasons, and securing our domestic comforts. The third object is the fabrication of raiment for clothing or decorating the person. When these wants are supplied, the mind is gradually directed to those operations of labour which contribute to the ornaments, the enjoyments, and the luxuries of life, by which a nation usually arrives at greatness, and a people becomes opulent.

The main element of this state of things is the spirit of commercial and manufacturing enterprise, which affords employment to myriads, and enables us to possess the surplus commodities of the most distant lands in exchange for the productions of our native industry. Every circumstance which tends to check this spirit circumscribes our means of employment to the industrious masses; and every undertaking, whether of a commercial, manufacturing, or national character, which contributes to social amelioration, is calculated to promote both useful and ornamental labour, and thus be the means of distributing the productions of industry among every class of society; while, at the same time, it affords ample funds for the exigencies of the State, the support of our public institutions, and the due sustentation of the unfortunate, the aged, and the infirm.

Various adventitious circumstances may tend to arrest the progress or check the prosperity of commercial enterprise—such as war or civil anarchy, or great political revulsions—all of which are ever destructive to the arts of peace; although, without question, the most formidable of all checks to social prosperity is a deficiency or excessive dearness of food. Presuming, however, that food is abundant, of which, under the operations of free-trade, we have the fairest prospect, the next social difficulty is that of affording employment to all who are dependent on labour for their daily subsistence, and thus distributing the food and other necessaries of life through the whole community. This principle of distribution, through the agency of useful labour, is to the body politic like the heart's blood in the body physical. It is the vital stream of social life, which, like the arterial current of the animal economy, passes from the highest to the lowest members of the State, and, as it flows in its course, imparts vitality, health, and energy to all. To afford employment to the labouring classes, in times of peace, has been the great difficulty of all modern statesmen. Some of them appear like children picking pebbles on the sea-shore, who are pleased with the discovery of a few worthless toys, instead of taking an expansive view of the vast ocean of wealth which lies expanded before them. Wm. Pitt recommended, as the great panacea for the want of employment, the army and navy, which, he stated, were always open to the working classes. But it must be evident that this advice can only be applicable in a time of war. The important difficulty is in affording employment to a great population during a period of peace, especially when steam and machinery, in many branches of manufacturing industry, can accomplish, by the aid of one man, what used to require a hundred.

It has been remarked, by a popular lecturer on social economy, that 'the condition of the working classes is constantly deteriorating, and that the producers of wealth receive a very inadequate portion of the results of their industry.' Some have ascribed popular distress to overproduction; but until every man, woman, and child has an abundance of food, clothing, and domestic furniture, the explanation is fallacious. If distribution were effective, over-production could not exist so long as multitudes were in want of those productions. In truth, the want of distribution, which is so lamentably defective all over Europe, may be looked upon as a kind of social disease, which is calculated to disarrange and enfeeble every portion

of the body politic. If the limbs and inferior members become diseased, from want of circulation and nutriment, the trunk itself must soon fall beneath its own weight.

Fortunately for the great interests of mankind, a new order of things, resulting from freedom of commerce and cheap food, has been called into existence. Steam and machinery, which at one time menaced the destruction of all physical abour, promise to accomplish more, in affording the means of productive employment, and thus promoting the principles of distribution, than all the statesmen or political economists of modern times have ever devised. Machinery, railways, steam navigation, manufactures, freedom of commerce, great national and local improvements, and the spirit of social regeneration, will be calculated to call forth the industrial energies of the labouring masses; and by our freely exchanging the surplus products of native industry for those of the whole world, we shall afford remunerative employment to myriads, and thus effectually carry out the great principles of distribution through every grade of society. But unless these principles are fully maintained and liberally fostered, the free current of distribution will be arrested; and the mighty population of the British empire, instead of constituting its glory and its strength, may become its weakness and its bane.

In Botany, *Distribution* is a word of extensive application, and of great importance in physical geography. There are general laws for the distribution of plants; and the number of known species scattered over the surface of the earth, as mentioned by botanists from the earliest periods, is thus given by Mr. Hinds:—Theophrastus (B.C. 300) mentions 500 species; Pliny (B.C. 70), 1000; Bauhin (A.D. 1683), 6000; Linnæus (1762), 8800; Persoon (1806), 27,000; Candolle (1820), 56,000; Dr. Lindley (1835), 86,000. Mr. Hinds states 89,000; and, computing for countries as yet unexplored, he supposes the total aggregate of species, which vegetate on the earth, to amount to 133,000. The general distribution of these various species is agreeable to certain laws depending on their latitudes, situation, elevation, or the diversity of climate. Thus the group of ferns, lichens, mosses, and fungi, in the equatorial regions, constitutes one-fifteenth of the vegetation of the plains, and one-fifth of that of the mountains; while in the temperate zone it forms one-half of the whole number of plants; and almost the entire vegetation of the frigid zone belongs to this family. The group of grasses, in the equatorial latitudes, constitutes one-fourteenth of the entire number of plants there existing; while in the temperate zone they constitute one-twelfth, and in the frigid climes one-tenth. The common heath, and other social plants which live together, are comparatively rare within the tropics, while they are diffusively spread over the sand-hills of Holland, Holstein, Jutland, Westphalia, and Hanover. Mosses and lichens, the *Cryptogamia* of Linnæus, form one of the chief botanical features of the arctic zone. In fact, the proportion of the cryptogamic to the phænogamic or flowering species increases as we

recede from the equatorial regions. Thus the former are to the latter, in the equatorial countries, as one to five; in Australia, as two to eleven; in France, as one to two; in several countries, nearly equal; and over the whole earth, as one to seven. The proportion of woody species to the herbaceous increases as we advance towards the equator. In the cold climates of high northern latitudes, where the earth is generally covered with snow, the vegetable tribes are few in number, and stunted in appearance. Thus in nothing have we more striking evidences of divine contrivance than in the wide distribution of vegetable life, and in the varied conditions under which it exists, at the different extremes of elevation and depression, of heat and cold, of light and shade, of solidity and solution. Thus, as Milner eloquently remarks, 'Forests of beech wave in the Himalaya at a greater height than that reached by the Finsterhorn of the Alps, or more than 14,000 feet; and there also shrubs flourish upon sites which are above the altitude of the hoary-headed Mont Blanc, the monarch of the European mountains. On the other hand, the bottom of the sea is clothed with an endless variety of green, red, and purple algæ; and in the dark caverns of the ocean, the vine-leaved fucus produces its enormous fronds, with a hue as green as that of grass. Melville Island, with its long dreary night, and nine or ten months of rigid winter, has in various places an abundance of moss, lichen, grass, saxifrage, the dwarf willow, poppy, and sorrel; and Captain Parry found a ranunculus in full flower, in a sheltered spot, during the second week of June. In a diametrically opposite condition, some plants of the Confervæ tribe thrive, living in hot springs, where the temperature is that of boiling water; and, at the commencement of the seventeenth century, a shrubbery flourished in the crater of the Vesuvian furnace. The rich black loam of the plains sustains luxuriantly an appropriate vegetation; while creeping plants derive sustenance from the hardest rocks, and alternate beautifully with the naked projections of mountain masses. Within the tropics magnificent trees grow up under the direct action of the solar beams; and in dens and caves of the earth, which have never been visited by the light of day, vegetable life defies the perpetual darkness.'

In Meteorology, the term *Distribution* is applied to the general diffusion of heat and light through the atmosphere. This law, although liable to variations and local incidences, is on the whole tolerably uniform. From numerous observations, which have been made in different parts of the world, it appears that for every one hundred yards of altitude the thermometer sinks one degree. 'This statement,' says Dr. Prout, 'probably does not, within moderate limits, differ much from the truth, though some late researches have rendered it probable, that while at different heights the rate of the decrease of temperature is uniform, the rate of altitude increases constantly, and according to laws very similar all over the world; that is to say, supposing the first 252 feet are equal to one degree, the second degree will be

equal to 255 feet, the third to 258, the fourth to 261, and so on. It is from the permeability of the atmosphere to the solar rays, that the temperature of the lower regions of the atmosphere is derived, not immediately from the sun, but from the earth. The surface of the earth absorbing the solar heat re-communicates that heat to the immediately incumbent atmosphere, while all the lower portions of the atmosphere remain unaffected.' The distribution of the solar heat through the atmosphere is principally effected by what is philosophically known as *convection*, which implies motion, or the currents that pervade the atmosphere. These currents, or winds, as they are commonly called, and their due distribution over the surface of the earth, are of the utmost importance in the great economy of nature, from their tendency to equalize the distribution of temperature over the entire surface of the earth. [CURRENTS OF THE ATMOSPHERE, *Supplt.*]

DISTRICTS, MILITARY, a term applied to the different localities or respective portions into which the country is divided for military purposes, and for securing co-operation when required. Thus the provincial districts of England are the South-Western, the Western, and the Northern. The first comprehends the counties of Dorset, Hants, and Wilts, of which Portsmouth is the head-quarters. The Western district embraces Cornwall, Devonshire, and Somersetshire, of which Devonport is the head. The Northern district, which is very extensive, includes the counties of Chester, Cumberland, Durham, Lancashire, Northumberland, Nottingham, Westmoreland, and York; the head-quarters of which is Rotherham. The troops stationed in other counties have their head-quarters in London, to which all their reports are transmitted; while those in Scotland send their reports to Edinburgh, which is the head-quarters of that portion of the kingdom. Ireland is divided into five military districts,—the Eastern, of which Dublin is the head-quarters; the Western, head-quarters Athlone; the Northern, head-quarters Armagh; the Southern, head-quarters Cork; and the South-Western, head-quarters Limerick. (*Military Cycl.*)

DITONE, in music, an interval comprehending two tones, the proportion of the sounds being 4:5; while that of the *semiditone* is 5:6.

DIURNAL MOTION, a term applied by astronomers and cosmographers to the daily revolutions of the earth round its axis, from west to east, by which all the apparent motions of the heavenly bodies can be accounted for. According to this now universally-established theory, the whole celestial hemisphere makes an apparent revolution from east to west; and during the period required by the earth to perform its diurnal revolutions, the sun, moon, and stars return, in the course of twenty-four hours, to the relative places they previously occupied. Although the paths of the stars are so different in the extent of the path they apparently traverse, those at the poles having much the shortest arcs, and those which rise in the east the longest, yet every star is above the horizon for the same period of time. But these appearances are all clearly explained, on astronomical principles, when we admit the theory of the diurnal revolutions of the earth; the motions of the heavenly bodies being only apparent to our senses, precisely as the banks of a river appear in motion to those who may be quietly seated in a steam-vessel.

Connected with the diurnal motion of the earth, is the *diurnal change in the variation of the compass*, which has been the source of much speculation. If we commence our observations of the magnetic compass about seven o'clock in the morning, we shall perceive the needle to have a slight westerly motion, which continues till about two o'clock in the day. At this period its direction appears to change, the needle slightly retrogrades, and returns eastward until evening. It then takes a westerly direction, and returns during the night, or early in the morning. Its maximum direction easterly is about seven in the morning. At some periods of the year, especially during the summer months, the daily change of variation amounts to 14′ or 15′.

DIUR'NI (Lat. *diurnus* daily), a family of lepidopterous insects, so called from their flying chiefly during the daytime. Also the name of a section of the *Accipitres*, or birds of prey.

DIVERGENT RAYS, in optics, are those which are in direct opposition to convergent rays, because they diverge from a point of the visible object, and continually depart from one another, in proportion as they are removed from the object.

DIVINATION, among the ancients, the art, or pretended art, of discovering future events, sometimes by a kind of inspiration, or divine afflatus; and sometimes by certain rites, experiments, or observations; as by sacrifices, the flight of birds, the entrails of beasts, omens, position of the stars, fire, earth, water, air, &c. Among the Eastern nations, more especially, the people were always fond of the illusions of divination and magic. 'When Moses published the law,' says Calmet, 'this disposition had long been common in Egypt and the neighbouring countries, and to correct the Israelites' inclination to consult divines, wizards, fortune-tellers, and interpreters of dreams, it was forbidden them, under very severe penalties; and the true spirit of prophecy was promised to them, as infinitely superior. They were to be stoned who pretended to have a familiar spirit, or the spirit of divination: and the prophets are full of invectives against the Israelites who consulted such, as well as against false prophets, who seduced the people.' Among the Greeks and Romans, even at their most enlightened periods, the practice of divination and augury was almost universal. [AUGURS.]

DIVISIBILITY OF MATTER, in physics, is that property by which the atomic particles of all bodies are capable of separation from each other. [BODIES, NATURAL, *Supplt.*] It has always been a question among philosophers, and still remains so, whether matter is capable of being divided *ad infinitum*; or whether there is not a limit beyond which the process could not go. Dr. Prout, in his 'Bridgwater Treatise on Chemistry,' has advanced some powerful reasoning on

this intricate subject. 'Magnitude or quantity, within the limits cognizable by our senses,' says he, 'has nothing to do with the properties of bodies; and how much soever we may subdivide a homogeneous body, still its visible component parts will all be similar to the original mass. Thus the minute but sensible portions into which a quantity of marble, of water, or even of the air, may be subdivided, are all found to possess precisely the same properties as the original aggregates. Nor do we stop at the limits defined by our organs of sense. We infer that the divisibility of matter may be carried much beyond these limits; that water, marble, and air, for instance, may be subdivided into parts so minute as to cease to be cognizable by us.'

Although this problem, perhaps, never can be satisfactorily solved, yet the extent to which division and subdivision have been carried in the arts is most amazing. Thus, in the gilding of buttons, five grains of gold, which is applied as an amalgam with mercury, is allowed to a gross; so that the coating left cannot be more than the 110,000th part of an inch in thickness. If a piece of ivory or white satin be immersed in a solution of nitro-muriate of gold, and exposed to a current of hydrogen gas, it will be covered with a surface of gold, not exceeding the ten-millionth of an inch in thickness. A single grain of blue vitriol will give an azure tint to five gallons of water. In this case the copper must be alternated ten million times, and yet there is sufficient in each drop of water to give it colour. Odours are capable of still further diffusion. A single grain of musk has been known to scent a room for twenty years. Animal matter likewise exhibits many instances of subdivision. The milt of a cod-fish, when it begins to putrefy, has been estimated to contain a billion of perfect insects; so that thousands of these little lives could be lifted on the point of a needle. One of the infusorial animalcules found in duck-weed is ten million times smaller than a hempseed;' and another discovered in ditch-water appears, on the field of a microscope, a mere atom endowed with sentient life; and millions of these, like sunbeams, play in a single drop of liquid. Yet these are but a very few instances of the wonderful minuteness to which the atomic divisibility of matter can be reduced.

DIVORCE (v. 471). During the session of 1857, the law of 'Divorce and Matrimonial Causes' underwent some important changes. The old laws were almost entirely abrogated; and a Court of Record, for the adjudication of cases, was established, which is presided over by the Lord High Chancellor, the Chief Justice, the Chief Barons of the three superior Courts of Common Law, and the Judge of the Court of Probate, which was constituted by the same act. The judge of the Court of Probate is styled the 'Judge Ordinary' of the new Court of Divorce, and has full authority to hear all matters therein arising, either by himself, or with one or more of the judges his colleagues. His salary is 5000*l.* per annum.

Decrees of divorce, *a mensâ et thoro*, are now at an end. Petitions for the dissolution of marriages, and other excepted cases, must be heard by three judges at the least, of which the judge ordinary is to be one. A sentence of 'judicial separation' (having the effect of old divorce from bed and board) may now be obtained, either by the husband or the wife, on the ground of adultery, cruelty, or causeless desertion for two years and upwards. Applications for such separations may be made, by either party, by petition to the court, or to any judge of assize, held in the locality where the parties reside, or last resided, or to the court of quarter sessions, or to the recorder of the city or borough in which the parties are or were last resident. The local authorities thus pointed out, have full power to receive such applications, and to decree a 'judicial separation.' They may also order alimony for the wife. An appeal, however, lies to the judge ordinary, of the regular central court from the decrees of these local authorities; but no such appeal can stay the *interim* execution of the order for separation.

Wives deserted by their husbands may at any time apply to a police magistrate, or to the petty sessions, for an order to protect property earned by themselves, or of which they may have come possessed since the secession of their husbands, against their husbands, or their husbands' creditors. Decrees of separation, obtained during the absence of the husband or wife, may be reversed, on application and proof. Wives 'judicially separated' are considered *femes soles*, as regards questions of property, and for purposes of contract and suing. According to the 39th clause of the rules and regulations of the court, applications, on the part of a wife deserted by her husband, may be made on summons to the judge ordinary, in chambers,—a course which saves the wife from exposing her case before a police magistrate.

An entire and absolute dissolution of the marriage may be presented to the Court of Divorce, on the ground that the wife has forfeited her conjugal rights by the crime of adultery, or that the husband has been guilty of adultery, or other violation of the marriage ties. Adulterers may be made co-respondents to petitions for divorce; and contested matters of fact may be tried, if the parties insist, by a jury. If the Court of Divorce be satisfied that there has been no collusion, condonation, or connivance, and that the charge of the petitioner is proved, the marriage will be absolutely and finally 'dissolved.' Alimony may be awarded to wives, even in the event of the marriage being thus dissolved.

Husbands may claim damages from adulterers if they please, and such claims will be heard and tried on the same principles, in the same manner, and subject to the same rules and regulations as actions for *crim. con.*, the damages being determinable by the verdict of a jury. Adulterers, made co-respondents, may be mulcted in the whole of the costs.

The custody of children is provided for by interim orders of the Court of Divorce.

Questions of fact may be tried before the court by the verdict of a jury, special or common;

and the court may direct issues to try matters of fact in any court of common law. All witnesses are sworn and examined orally in open court, where their attendance can be secured.

After the lapse of a given period, it is lawful for the parties divorced to marry again, as if the prior marriage had been dissolved by death, provided that no clergyman in holy orders, of the United Church of England and Ireland, shall be compelled to solemnize the marriage of any person whose former marriage may have been dissolved on the ground of his or her adultery.

Among other enactments, it is provided that a person may sue *in formâ pauperis*, on his making an affidavit, that he or she is not worth 25*l.* after the payment of all just debts.

Married women may dispose of their reversionary interest in personal property; but the Act does not enable married women to dispose of any interest in personal estates, settled upon them, or agreed to be settled, on the occasion of their marriage.

The forms for carrying out the Act are very concisely worded; and the fees are of a moderate character; the highest being 15*s.*, and the lowest 6*d.*, with the exception of the attendance of an examiner to take the evidence of the witnesses. The principal fees in the list are 2*s.* 6*d.* and 5*s.* There are twenty at 5*s.*, and twelve at 2*s.* 6*d.*, out of a table containing fifty-nine fees.

DOCTOR (v. 478). This title, as an academic distinction, first came into use about the middle of the twelfth century, which was the period of the first dawning of literature, after its extinction in the dark ages. At all the universities, where the title of Doctor is granted, there are certain examinations and periods of probation to go through. Thus to obtain the distinction of Doctor of Laws in the University of Cambridge, the candidate must have previously been five years a Bachelor of Laws, or seven years a Master of Arts; but to obtain the title of Doctor of Divinity the candidate must have been seven years a Bachelor of that faculty. To obtain the title of Doctor of Physic the same terms are required as those for the faculty of Law. The same periods of probation, with some slight variations, are required at Oxford and Dublin. No clergyman can be appointed a bishop until he has taken a Doctor's degree; neither can any medical student practise as a physician until he has graduated as a Doctor of Physic; nor any civilian plead as an advocate in the Ecclesiastical Courts without the diploma of Doctor of Laws; but since the enactment of the new laws of divorce and probate, the civilian doctors have sunk into comparative nihility. Indeed the title may now be considered simply as one of literary distinction; the courts of civil and canon laws, for which these titles were originally granted, having nearly fallen into desuetude.

DOCTORS' COMMONS (v. 478). This ancient college, once the great seat of civil and ecclesiastical law, since the establishment of courts for the trial of 'Divorce and Matrimonial Causes,' and 'Courts of Probate,' which came into operation in January 1858, has been shorn of its powers and importance, and may now be considered as defunct. [DIVORCE, and PROBATE, *Suppl.*]

DODO'NA (v. 484). The inflammable fountain, near the ancient temple of Dodona, dedicated to Jupiter, was, in all probability, the cause of that site being fixed upon for the delivery of oracles; for here was situated the most ancient oracle of Greece. The natural philosopher and poet of Rome, Lucretius, thus describes this remarkable phenomenon:—

> "A fount there is, which, though cold itself,
> With instant flare the casual flax inflames
> Thrown o'er its surface; and the buoyant torch
> Kindles alike immediate, o'er its pool
> Steering the course th' etherial breeze propels."

This description appears to be confirmed by Pliny; and at the present day we find that in Illyria and Zante, which are no great distance from the site of Dodona, as pointed out by Col. Leake, there are several pitch springs, which, according to Herodotus, were in existence above 2300 years ago. 'In Zacynthus,' says the historian, 'I saw pitch brought up out of the water of a pond. Indeed there are several of these ponds; but the largest of them is about 70 feet square, and 12 feet deep.'

DOG-DAYS, a term applied to the hottest period of summer, which, in ancient astronomy, was the time when Sirius or the Dog-star rose immediately before the sun. According to the almanack, the Dog-days begin on the 3rd of July, and end on the 11th of August. But the helincal rising of Sirius, owing to the precession of the equinoxes, is later in the year; hence our dog-days have not now the same relation to the star Sirius as formerly.

DOLICHU'RUS (Gr. *long-tailed*), a genus of Hymenopterous insects, of the family *Fossores*.

DOLI'CHUS, a genus of Coleopterous insects, of the family *Carabidæ*.

DOLIO'LUM (Lat. *a little barrel*), in Zoology, a genus of the *Diphydæ*, with a gelatinous, cylindrical body, having the appearance of a cask; hence the name.

DO'LIUM (Lat. *a large-bellied barrel*), a genus of Mollusca, in which the shell is nearly globular, ventricose, and furrowed, and the aperture large and oval.

DOMINUS, a title prefixed to a man's name in the Middle age, which usually denoted him a knight or a clergyman; and sometimes a gentleman not a knight, especially a lord of a manor. *Domina* was the title given to honourable women, who in their own right of inheritance held a barony.

DONEGAL, COUNTY OF, in Ireland (v. 510-14). According to the census of 1851, the population of the county was 254,288, and the inhabited houses 51,389. The population of the principal places was as follows:—

Ballyshannon	3513	Letterkenny	2161
Donegal . par.	6588	Lifford . . .	752
. t.	1366		

D'ORSAY, COUNT ALFRED, son of General D'Orsay, was born at Paris in 1798. At an

early age he entered the French service, and, while stationed as a lieutenant at Valence, the regimental mess happened to be established in the hotel where Lord Blessington alighted on his way to Italy, in November 1832. A chance acquaintanceship thus ensued, which soon ripened into intimacy; and at his lordship's invitation the count joined the noble party in their trip southwards. Their arrival at Genoa, and the handsome person of the count, are thus noticed by Lord Byron, in a letter to the poet Moore, dated April 2, 1823: 'Your other allies, whom I have found very agreeable personages, are Milor Blessington and *épouse*, travelling with a very handsome companion, in the shape of a French count (to use Farquhar's phrase in 'The Beaux' Stratagem'), who has all the air of a *Cupidon dechainé*, and is one of the few specimens I have seen of our ideal of a Frenchman before the Revolution.'

D'Orsay afterwards visited England, and was introduced into the first society. In Lord Byron's correspondence we find mention made of the count's 'Journal' while in England, which his lordship calls 'an extraordinary production, and of a most melancholy truth in all that regards high life in England. I know, or knew, personally, most of the personages and societies which he describes; and, after reading his remarks, have the sensation fresh upon me, as if I had seen them yesterday. The most singular thing is how he should have penetrated, not the fact, but the mystery, of the English ennui, at two-and-twenty. I was about the same age when I made the same discovery, in almost precisely the same circles; but I never could have described it so well.'

In due time it was arranged that D'Orsay was to be a fixture in the Blessington family, by becoming the husband of Lady Harriet Anne Gardiner, his lordship's only daughter by his first wife; and they were forthwith married at Genoa on the 4th December, 1827. Lord Blessington dying at Paris in 1829, the peerage became extinct. His countess became a star in the literary firmament of England, and Count D'Orsay, having obtained considerable Irish property from his marriage, resumed in London the career of sportsman, exquisite, artist, and general *arbiter elegantiarum*, and few men in his position showed greater accomplishments. It was in England that the count became acquainted with Prince Louis Napoleon; and soon after the arrival of the prince in France D'Orsay fixed his own residence in Paris. The President of the Republic had not a more devoted and sincere friend than D'Orsay; and it was at the moment when the prince had attached him to his person, by the title and *functions* of 'Superintendent of the Beaux' Arts,' that he lost him for ever. This appointment was announced only a few days before his death, which took place in August 1852.

DORSETSHIRE (v. 525-33). According to the census of 1851, the entire population of the county was 184,207; of which 89,204 were males, and 95,003 females. Of houses, inhabited and uninhabited, there were 37,725. The area of the county was estimated at 987 square miles, or 632,025 acres, with a population of 186 persons to each square mile. The population of the principal parishes and towns was as follows:—

Beaminster . .	2085	Poole	9255
Blandforum, mun.	2504	Poorstock . .	1044
——— . t.	3013	Portland . . .	5195
Bridport . . .	7566	Shaftesbury, mun.	2503
Canford Magna	4065	——— parl.	9404
Cerne Abbas .	1343	Sherbourne . .	3878
Chardstock . .	1387	Stalbridge . .	1326
Corfe Castle .	1966	Sturminster Newton Castle .	1916
Cranbourne . .	2737	Swanage . . .	2014
Dorchester . .	6394	Wareham . .	7218
Fordington . .	3100	Weymouth & Melcombe Regis .	9548
Gillingham . .	3775	Wimbourne Minster . . .	2295
Lyme Regis, mun.	2661	Wyke Regis .	1898
——— parl.	3516		
Melcombe Regis	9458		
Netherby . .	2066		

DOUAY BIBLE, the English translation of the Old and New Testament, sanctioned by the Roman Catholic Church. (Craig.)

DOVEDALE OF THE PEAK, is one of the most picturesque and striking localities in the kingdom. It is so called from being in the Peak of Derbyshire, and from the name of the river Dove, which flows through the valley. It is approached through a narrow defile, of high and precipitous limestone rocks, which, Dr. Plot states, are so high, that in rainy weather their summits may be seen above the clouds; and the passage is so narrow, that in the depth of the winter months the inhabitants never see the sun. The precipitous rocks on each side of the valley are three miles in extent; the sides, in some places, closely approximating. Sometimes their opposite sides present salient and re-entering points, which so exactly correspond, that it seems as if the valley had been formed at once by some convulsion of nature, which had rent asunder what had originally formed a compact mass of rock.

DOWN, or DUNE, a bank or elevation of sand thrown up by the sea. These downs occupy an immense extent of coast line, and frequently penetrate to a considerable distance inwards. When the bottom of the surrounding sea is arenaceous, the heavy waves drive the sand upon the shore, particularly where the land is level or flat. This sand becoming partially hard at every reflux of the tide, a certain quantity is heaped upon the beach by the action of the wind. Then accumulating around tufts of grassy bushes, or stones, it becomes at length a continuous ridge, which in time forms hillocks, or mounds, of considerable size. The minute particles at the surface of these sand-hills are then carried inwards by the sea-breezes, and gradually give an increased breadth to the downs. By this means the cultivable soil, in many parts of the kingdom, has been extensively invaded, and rendered unfit for agricultural occupation. Different portions of the Lancashire coast, for instance, exhibit these sandy formations, especially in the neighbourhood of Southport, at the mouth of the Ribble. Here the loose particles, when exposed to the action of gales of wind, are sometimes shifted in enormous quantities, so as to produce serious results. The sand is so deep

and loose in dry weather as to be impassable; but after a good shower of rain, it becomes consolidated, and the surface is comparatively hard. Much progress, however, has been made of late years in converting these waste downs into habitable or cultivable tracks, by the application of what is termed 'sea-slutch,' a sort of stiff marl, dug below high-water mark. In some parts of Holland, where these downs are always in the course of formation, they are of great utility in defending the coasts from the encroachments of the ocean. They form huge masses, and in some places are so high as to intercept the view of the sea even from the tops of the loftiest spires. But this protection has its drawbacks, for sometimes, during the prevalence of strong sea-winds, clouds of sand are raised from the beach into the air, and driven into the interior, by which the vegetable soil is seriously damaged, and a scene of desolation presents itself.

DOWN, COUNTY OF, Ireland (v. 544-9). According to the census of 1851, the population of the county was 325,575, and the inhabited houses 65,102. The population of the principal towns was as follows:—

Ardglass . .	pa. 1,439	Downpatrick	t. 4,651
——— . .	t. 1,066	Dromore	pa. 14,954
Ballymacarret .	7,000	——— . .	t. 2,110
Banbridge . .	3,324	Newry .	pa. 25,168
Bangor : .	pa. 9,564	——— .	bor. 13,227
——— . .	bor. 6,388	——— . .	t. 13,556
Donaghadee	pa. 8,557	Newtownards	pa. 13,886
——— ———	t. 3,151	——— ———	t. 9,551
Downpatrick	pa. 8,812	Portaferry . .	2,107
——— ———	bor. 4,866	Rathfriland .	2,183

DRACONA'RIUS, among the ancient Romans, a kind of standard-bearer, so called from the *dracones*, or *dragons*, which the Persians, Scythians, and Parthians, bore on their standards. This custom was borrowed by the Romans from the Parthians, the Dacæ, or the Assyrians. The Roman *Dracones* were figures of Dragons painted in red on their flags, as appears from Ammianus Marcellinus; but among the Persians and Parthians, they were, like the Roman eagles, figures in full relievo; so that the Romans were frequently deceived, and took them for real dragons. The soldier who bore the dragon or standard, was called by the Romans Draconarius; and the emperors carried the custom with them to the eastern world.

DRAGON, a name frequently mentioned in the allegories of the Jews, Chinese, and other oriental nations. Among the Greeks and Romans it was a kind of fabulous monster furnished with wings and feet, and having the head and body of a serpent. 'It is from those giant serpents,' says Dr. Kitto, 'which, at a remote period, were evidently still more colossal than that which is reported to have opposed a Roman army, or the skeleton of another, above a hundred feet in length, found more recently in India, that the vague but universally spread notions must have arisen in the earliest antiquity, and been perpetuated to our own time, which typified the deluge and all great destructive agents under the form of a dragon, or monster serpent. We find them embodied by the ancients in the form of dragon temples, consisting of huge stones set upright in rows, such as that of Colchis no doubt was. Such temples once existed in Asia Minor, Northern Africa, Gaul, and Britain (that at Abury, in Wiltshire, being several miles in length); and where their design can be traced out sufficiently in existing remains, the serpentine figure is ever observed to glide through or sustain a diagram of similar materials,—a circumstance which appears best explained by considering them more or less astronomical, but fundamentally reposing upon traditions concerning the ark, the preserver of human life in the act of struggling with the overwhelming element.' These dragons are frequently introduced into the legends of mediæval chivalry.

In Zoology, Dragon is the name of the genus *Draco*, or flying lizards. [DRACO, or DRAGON.]

DRAGON ROOTS. A term applied to pieces of cane that have had the fibres of the wood beaten out and separated at the one end, so as to form a sort of brush. They are used for the purpose of cleansing the teeth. The decorticated roots of the vine and marshmallow are sometimes employed for the same purpose.

DRAININGS, in rural economy, a term applied to the flowing of urine, or any excrementitious, feculent, or putrescent liquids, into the common dung-heap of the farm-yard. The application of drainings to compost heaps is now extensively practised both by scientific and practical farmers; and those who neglect this provision sustain material loss by being driven to the necessity of making expensive purchases of manure, both at home and abroad. But, as it has been judiciously observed by a German writer on agricultural chemistry, 'the farmer who buys guano, bone-dust, or other artificial manures, but does not look carefully after his drainings, is extravagant; for he brings the same thing into his yard at great cost, which he might have for nothing, if he did not suffer it to flow or evaporate uselessly away from the same. That drainings fertilize the soil, every farmer must be aware, even from childhood; but how great is their power in this respect, and how much of this power may be lost by careless preservation and treatment, many farmers do not yet know. Were it otherwise, draining tanks, commodiously placed, would be provided in every farm-yard; one would no longer find on a farm great puddles of dungy and urinous drainings, or brown currents of liquid guano streaming forth from every farm inclosure, to be lost in the gutters or village pond.'

The great manuring value of drainings arises principally from the quantity of nitrogen and potash contained therein. We find that in the twelve months' drainings of a cow there exists as much of nitrogen as is to be found in 5 cwt. of the best guano; and of potash, about 1¼ cwt. Moreover, if these twelve months' drainings were collected and dried, it has been computed that about 6 cwt. of solid extract might be obtained from them, which in fertilizing power would be equal to the best South American guano, worth about 12*s.* or 14*s.* per cwt.

In the collecting of compost heaps, and the application of drainings, all the refuse matters connected with a farm may be profitably made use of; such as soap-suds, dish-water, blood, ashes, soot, peat-dust, saw-dust, rubbish, sweepings of mud, dirt, &c. These heaps may be kept moist by being frequently saturated with urine; and it will be found that when its watery portions have evaporated, the ammoniacal combinations produced by its nitrogen are still retained, partly by the earth, and partly in the humus. The process of fermentation is materially accelerated by occasionally stirring up the mass. Thus by the accumulation of such compost heaps, the farmer is able to secure considerable advantages from the employment of many substances and liquids which are ordinarily thrown away, or allowed to remain as nuisances on his farmstead.

(Stockhardt's *Agricultural Chemistry; Agricultural Journal.*)

DREP'ANE (Gr. δρέπανον a sickle), a genus of fishes, of the family *Chætodonidæ*. The tail is truncate, and the pectoral wings extremely long and falcate. In many respects the species resembles the Scatophagus.

DRIFT, in Geology, one of the terms given to the diluvial formations of the earth's superficies, consisting of gravel, clay, and boulder stones, transported from a distance by the action of rushing waters. Beneath these deposits there is usually a substratum of sand, which appears to be an even and quiet surface, while the two upper deposits are tumultuous accumulations, which show different degrees of comminution, as if commingled by the violent action of currents of water, and at a period long posterior to the lower formation of level sand. Mr. Lyell assigns this drift to the newer pliocene era; and observes that it may be distinguished from the older tertiary deposits by its generally unstratified character, and confused aggregation of deposits. Moreover, in most instances, the materials have had some other local origin, having sometimes been derived from rocks within a few miles of the spot where they are now found; and at other times transported from mountains of remote lands, separated by seas from their present localities.

Along the eastern side of England, from the Thames to the Tweed, these drifts often present themselves in the form of extensive and thick beds of gravel or loam, not only in the valleys but on the elevated table lands. In the midland counties of England the drift accumulations are abundant; and throughout the oolitic, lias, and red marl districts, similar masses occur,—the gravelly or pebbly materials consisting of rocky fragments of the most distant ages, and evidently transported from remote localities. Mr. Conybeare observes that 'from Houghton-on-the-Hill, near Leicester, to Braunston, near Daventry, proceeding by Market Harborough and Lutterworth, the traveller passes over a continuous bed of gravel for above forty miles. Pebbles of porphyry have been observed in the drift gravel near Dunstable, in Bedfordshire; although porphyritic rocks do not occur at any point nearer than the Charnwood Forest, in Leicestershire.'

In many parts of the world the transported material, or drift, is found to be highly metalliferous; sometimes yielding gold, platinum, lead, or tin, and even precious stones; from which we may safely conclude that the native mountain beds of these products have been broken down, and reduced, by violent action and trituration, to a gravelly deposit, and the mineral wealth of the mountain beds carried along with the debris. The drift has also been found to contain numerous fossils, as well as animal remains of extinct species, but belonging to genera still extant, which are confined to counties far distant from the site where these remains have been discovered. Thus in northern latitudes, far remote from their native climes, the skeletons of colossal herbivorous mammalia occur in great abundance, consisting of the elephant and the mastodon, the hippopotamus, the megatherium, and the rhinoceros, and numerous other animals, the denizens of tropical lands.

In the drift of gravel, clay, or sand, there often exist masses of rock, or boulders, usually denominated *erratic*, from their being found at a considerable distance from their original site. Probably owing to alluvial agency, after their diluvial passage, the accompanying debris of gravel and sand has been removed, and these stones now appear isolated, like some of the rocking stones found in Cornwall, Wales, Scotland, and other parts of the country.

Dr. Buckland mentions blocks of granite and sienite, of a peculiar character, scattered over the plain of Carlisle, which had evidently been drifted from the Criffle Mountain in Galway, across the Solway Frith, while large blocks of another kind of granite had been drifted in still greater numbers from Ravenglass, in Cumberland, over the plains of Lancashire, Cheshire, and Staffordshire, where they lie in masses of several tons weight. Indeed the sizes of these stones are sometimes enormous. One of these, an insulated drifted mass of granite weighing 1500 tons, lay for ages on a marshy plain near the city of Petersburg. It was at length removed thence; and from it was hewn the pedestal of the celebrated statue of Peter the Great. Near Neufchatel, there is one of these erratic rocks consisting of a mass of granite, which is 40 feet high, 50 long, and 20 broad, and weighs 3,800,000 pounds. How powerful must have been the oceanic drift which could have disruptured and carried these mighty masses from their original sites!

(Lyell; Conybeare.)

DRUGS. In consequence of the many fatal mistakes which have been committed in the sale of drugs, a system of inspection by recognised medical authorities has been adopted with the most beneficial results. At a late inspection of apothecaries' shops in London, by the censors of the College of Physicians, and the wardens of the Society of Apothecaries, they had the satisfaction of observing a decided improvement in the quality of the drugs and preparations. Various new precautions had been adopted, to avoid the danger of mistakes in dispensing poisonous materials; such as the use of bottles of particular form and colour to contain deleterious substances; together with

plans to draw attention to the bottle itself, on dispensing poisonous medicines, such as having the stopper so tied to the neck of the bottle that it could not be taken out without attracting the notice of the dispenser. The president and censors approved these expedients, and agreed that some such precautionary plans should be recommended to all dispensing chemists, and they are prepared to take such measures as may be best calculated to carry into effect such reform.

DRUM (v. 582). In military matters there are various beats of the drum, which indicate certain signals perfectly intelligible to officers and men, and which form a most important feature in military science. For instance, the beat of the drum called the *general*, is intended to give notice to the troops that they are to march. The *march* is the command to move, always with the left leg first. The *assembly* is the order for the different corps to repair to the place of rendezvous, or to their respective colours. The *alarm* is intended to give notice of danger, so that every man may be ready for immediate action. *To arms!* is the summons for soldiers who are dispersed to collect together, and be prepared for action. The *parley* is a signal denoting a wish to hold a conference with the enemy. *Tat-too* is the general order for all to retire to their respective quarters. The *réveille* is always sounded at the break of day, and is intended to warn the soldiers to rise, and the sentries to forbear challenging. The *retreat* is usually beat, in both garrison and camp, a little before sunset, at which time the soldiers repair to their quarters, and the gates are closed. It is also the signal for an army to draw off from the enemy, and take up other positions. (*Military Cycl.*)

DRYADS, in Mythology, a kind of semi-divinities, whom the ancients supposed to inhabit woods and groves. The *Hamadryads* were deities or nymphs, who were attached to particular trees.

DRYING MACHINE, an implement used by dyers, bleachers, calico-printers, &c., for promoting the process of drying by centrifugal action. It is only of comparatively recent introduction, but appears to possess considerable advantages over the old method of drying. It is thus described in a little work, entitled 'Novelties, Inventions,' &c.:—'The wet mass of cloth or yarn is put into a hollow cylinder; this cylinder is made to revolve from one to two thousand times in a minute; the moisture is driven from the cloth with great violence; openings are left to afford an exit for this water into an outer vessel; and in a few seconds the cloth is nearly dry. In some of the baths and washhouses now established, machines of this kind are made to supersede the hard necessity of "wringing" the wet linen.'

DRY'INUS, a genus of Hymenopterous insects, of the family *Securifera*. Also, a genus of Ophidian reptiles or serpents, with the head and tail very long.

DRYMOPH'ILA (Gr. *forest-loving*), a genus of birds, of the family *Merulidæ*, belonging to the Ant-thrushes.

DRYOT'OMUS, a genus of the true Woodpeckers, and of the family *Picidæ*.

DRY-ROT, a disease in wood which destroys the cohesion of its parts. It is attributed to the attacks of certain fungi, especially the *Merulius lachrymans*, and the *Polyporus destructor*, the filaments of which appear upon the surface of the wood, and spread over it like a rough white skin. Many plans have been devised for the prevention of this destructive disease, and Ryan's patent has been considered as one of the most effective.

DUBLIN, County of, Ireland (v. 592-9). According to the census of 1851, the population of the county (including the city) was 404,992. The city of Dublin is the capital of the county, as well as of all Ireland. Its population, according to the last return, was, for the municipal borough 252,599; and for the city and suburbs, 287,729. Kingstown is the next place in importance, and contains a population of 10,232.

DULCAMA'RA (Lat. *bitter-sweet*), the Woody Nightshade, or *Solanum dulcamara* of botanists. On chewing the roots and stalks, a sensation of bitterness is first produced, which is followed by a degree of sweetness, from which it has received the name.

DULWICH COLLEGE (v. 613). According to an Act of Parliament, which came into operation on the 31st of December, 1857, the old incorporation was altogether abolished, and the charity reconstituted, under the name of 'Alleyn's College of God's Gift.' In the scheme of the Charity Commissioners, which this Act embodies, there are 115 pensioners; and the Archbishop of Canterbury and his successors are to continue to be visitors of the charity.

DUMBARTONSHIRE, Scotland (v. 613). According to the census of 1851, the population of the county was 45,103, and the inhabited houses 4792. Dumbarton is the principal town, the population of which is, for the parish 4766; for the town 4590; and for the parliamentary borough 5445.

DUMFRIESSHIRE, Scotland (v. 615-19). According to the census of 1851, the population of the county was 78,123, and the inhabited houses 13,300. The population of the principal towns was as follows:—

Annan	pa. 5,848	Lochmaben	pa. 3,127
———	bor. 3,426	———	t. 1,408
Gretna	1,830	———	bor. 1,092
Langholm	pa. 2,990	Lockerbie	1,315
———	t. 1,406	Moffat	pa. 2,304
———	bor. 2,362	———	t. 1,413

DUNBAR, GEORGE, Professor of Greek Literature in the University of Edinburgh, F.R.S.E., &c., was born at Coldingham, in Berwickshire, in 1774. He was of humble parentage, and was designed in early life for a gardener; but having received serious injury by a fall from a tree, he was thus incapacitated for the humble occupation to which he had been destined. While still suffering from the immediate effects of his injury, he attracted the notice of a neighbouring proprietor, who aided him in obtaining a liberal education, and he was ultimately rewarded by

seeing him appointed Professor of Greek in the University of Edinburgh, in 1805. His publications, in connection with the language and literature to which he had devoted himself, were numerous; the principal of which were:—'Exercises on the Syntax, and Observations on some peculiar Idioms of the Greek Language;' 'Analysis on the Formation of the Tenses of the Greek Verbs;' 'Prosodia Græca;' 'An Inquiry into the Structure and Affinity of the Greek and Latin Languages, with occasional comparisons of the Sanskrit and Gothic;' 'A Greek-English Lexicon, with Addenda, and Critical Remarks on various passages in the Classic Authors and the New Testament;' 'Greek-Prosody, with Dissertations on the Versification of Homer.' His most important work, however, is the 'Lexicon of the Greek Language.' The author, in his preface, tells us, he was engaged in it for a period of eight years, and of his assiduous industry and unwearied research it is an enduring memorial. He died in 1852.

DUNKERS, a religious sect belonging to the United States, which was first established in Philadelphia about 1721. They consider themselves as universalists, hold love-feasts, and practise abstinence and mortification, under the idea that, by so doing, they effect the salvation of themselves and others. They baptize by immersion, dress like Dominican friars, and live as vegetarians, except at their love-feasts. They disbelieve in the eternity of future punishments.

DUNS, in the history of the ancient Britons, were fortified towers, of a circular form, erected on the summits of hills. Of these there are remains still existing in different parts of the country. There is one on the summit of Dunmore, with two rows of walls; the outer one being about 1000 feet in circumference; the area between the outer and inner wall is about 200 feet in diameter.

DURHAM, COUNTY of (v. 635-41). According to the census of 1851, the entire population of the county was 390,997; of which 196,700 were males, and 194,297 females. Of houses, inhabited and uninhabited, there were 67,771. The area of the county was estimated at 973 square miles, or 622,476 acres, with a population of 399 persons to each square mile. The population of the principal places was as follows:—

Barnard Castle	4,357	Framwellgate	3,085
Bishop Auckland	4,400	Gateshead	25,568
Bishop Wearm.	35,035	Hartlepool	9,503
Chester-le-Street	2,580	Haswell	4,356
Coxhoe	4,101	Hedworth, Monkton	3,835
Crook & Billy Row	2,764	Heworth	8,869
Crossgate	2,074	Hetton-le-Hole	5,664
Darlington	11,228	Houghton-le-Spring	3,224
Dawdon	3,538	Ivestone	2,500
Durham	13,188	Monk Wearm.	3,366
Elvet	4,207	Monk Wearmouth Shore	10,109
Forest	4,358	Newbottle	2,067
Painshaw	2,120	So. Shields	28,974
Pittington	2,530	Southwick	2,721
Sedgefield	1,362	Sunderland mun.	63,897
Sherburn	2,363	——— parl.	67,394
Shildon	2,144	Tanfield	3,480
Stanhope	2,545	Thornley	2,749
St. Giles, or Gilligate	5,423	West Auckland	2,303
St. Nicholas	3,031	Westoe	19,349
Stockton mun.	1,807	Wingate	2,456
——— t.	9,808	Winlaton	5,627
Stranton	4,008	Witton Gilbert	1,758
		Walsingham	4,585

DUUM'VIRI (v. 648). The appointment of these two magistrates first took place under Tarquinius Superbus, the seventh and last king of Rome. Their especial duty, in the first place, was to take charge of the Sybilline books, which were supposed to contain the fate of the Roman empire. Their office was of a sacred character; and the oracles, which were deposited in the Capitol, could not be consulted without their authority. It appears, however, that their number was increased at different times, until at length they received the name of Decemviri. There were also magistrates of an inferior order, who bore the appellation of Duumviri; as the *Duumviri Capitales*, who were chosen out of the decurions, and were judges in criminal cases:—the *Duumviri Municipales*, who had the same judicial and political authority, in the free towns of Italy, as the consuls at Rome;—the *Duumviri Navales*, who were first established at the period of the Samnite war, at the request of Decius, tribune of the people. Their duty was to superintend and regulate the affairs of the fleet, to appoint marine officers, and to act as general commissaries in the fitting out of the Roman squadrons. (Nuttall's *Class. Dict.*)

DWARF, a general name for an animal or plant which is below the usual size of the kind or species to which it belongs; but the term is more particularly applied to persons who never grow beyond two or three feet in height, of which there are many remarkable instances recorded in history. It is related by Pliny, lib. 7, cap. 16, that Julia, the niece of Augustus, had a dwarf, named Coropas, who was not more than two feet and a hand's breadth in height; and a freed maid of Julia's, named Andromeda, was of the same height. Suetonius also relates that Augustus Cæsar exhibited in his plays a young man not full two feet high, who weighed but seventeen pounds, yet had a strong and manly voice. Zuinglius, and also Vossius, in his Institutes, lib. 1, cap. 5, state that in the time of Iamblicus there lived Alypius of Alexandria, a most excellent logician, and a famous philosopher, but so diminutive, that he scarcely exceeded a cubit, or one foot five inches and a half, in height. Marcus Varus reports that Marius Maximus and Marcus Tullus were but two cubits, or two feet eleven inches high, and yet they were both gentlemen and knights of Rome.

In modern times, we find mention of Jeffrey Hudson, who was born at Latham in Rutlandshire, and at eight years of age, being under a

foot and a half in height, was taken by the Duchess of Buckingham, who clothed him in satin. At a splendid feast given by the Duke, there was a cold pie, and on its being opened, little Jeffrey started up in complete armour. Soon after he was presented to Queen Henrietta Maria. It was a strange contrast to see him and the King's gigantic porter, William Evans. In a masque at Court, Evans lugged out of one pocket a long loaf, and out of the other, instead of a piece of cheese, he pulled out little Jeffrey. He was employed upon a kind of embassy to France to bring over the queen's midwife; and on his return was taken by a Flemish pirate. This captivity of his is celebrated by Sir William Davenant, in a poem called 'Jeffreidos.' He died about the year 1680, being upwards of sixty years of age.

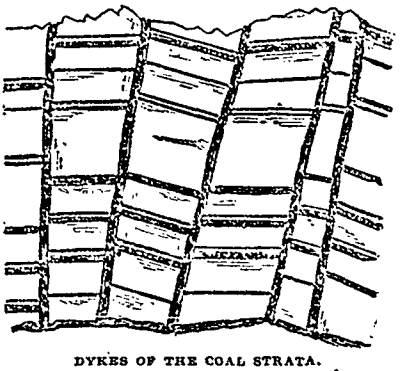
Some few years ago, there was exhibiting in London an American dwarf, a little more than two feet in height, called 'Tom Thumb.' He was introduced to the Queen, before whom he exhibited his dramatic powers, which were very striking, especially in the personification of Napoleon Bonaparte. He appears to have been a shrewd and intellectual little personage; and drew large audiences to the different theatres and public places, where he was in the habit of acting Tom Thumb and other similar characters.

DYE-STUFFS (v. 650–53). Within the last few years a vast number of new colouring materials have been discovered, or made available for dying processes; and according to the Report of Jury, No. 4, on the Exhibition, many improved modes have also been devised for economically applying those already in use. Hence a great demand has arisen of late years for various dye-stuffs. It appears that in 1850, there were imported no less than 261,861 cwts. of madder, and 693,800 cwts. of logwood; and at the present time the attention of practical men is being extensively directed to the newly-discovered dye-materials of distant countries.

DYKES (v. 654). In our coal districts, immense walls or dykes of trap (many of which were evidently injected a considerable time after the deposition of the stratified rocks) very frequently occur. It is also found that the same beds occupy different levels on opposite sides of the dyke, the corresponding parts being thrown out of the original plane of stratification; sometimes only a foot or two, at others even so much as 500 feet; so that the same seam of coal which on one side of the dyke is perhaps not more than a few feet from the surface, may be sunk several hundred feet on the other side. But it is very difficult to determine whether it was the higher surface that was originally upheaved, or the lower one that was depressed.

The great dyke, which extends from Greenside, in Durham, to Whitby, in Northumberland, is a remarkable one. It has thrown down the strata, on the north side, between five and six hundred feet. But in a branch of the Coaly Hill dyke, which traverses the Walker Colliery on the Tyne, and is quite vertical, it is found that there is no alteration of level in the strata through which it passes. The dyke at Bartreeford throws down the strata 480 feet on its west side. Near Bilston, in South Staffordshire, there is a dyke which has the effect of reversing the dip of the beds. On one side it dips to the south, and on the other to the north. These dykes are sometimes of immense thickness. In a part of the Newcastle coal-field, in Montagu Colliery, there is a dyke which is twenty-two yards wide.

It sometimes happens that several of these dykes are found at very short distances from each other; of which the annexed diagram, presenting a section of the coal measures in Jarrow Colliery, county of Durham, affords an example. Here there are five dykes, showing different levels of the coal strata on each side.



DYKES OF THE COAL STRATA.

From all geological observation it appears evident, that these dykes have been, like lava, produced through the agency of subterranean heat, from the interior of the earth, either filling up vents previously existing, or forcing themselves through the superincumbent strata of the earth's crust. Thus the Coaly Hill dyke, which extends from the western side of Northumberland to the sea, has charred the beds of coal with which it is in contact; and the Cockfield dyke, which underlies the coal measures of Durham, has reduced the coal in its vicinity to a calcined mass. It was perhaps from the same cause, that the collieries of Durham, not many years ago, caught fire, and continued to burn for some years.

DYNAM'ICS (v. 655). The following are the fundamental principles of the dynamical theory of the earth, as recently propounded by Mr. A. T. Ritchie. He says, that although the earth at the creation revolved around the *un*-illumined sun, by means of the same laws which govern its present orbital motion, it was not impressed with *rotatory* motion; but was in form a sphere, without inequalities of surface, and surrounded by an atmosphereless ocean, which contained innumerable tribes of living creatures, and various kinds of plants, of both of which there were several successive creations; and that during the protracted period of non-rotation, those materials, which were afterwards to constitute its *geological* and part of its *physical* phenomena, were being formed, whilst the circumfluent ocean was, simultaneously, undergoing preparation for its present state of perfection. That when these creative operations had

attained a state conducive to subsequent development, *Light* was introduced into the material universe, and, by means of its expansive power, caused the rotation, around their respective axes, of the earth, the sun, and other rotating spheres of our system. That the protorotation of the earth, while it occasioned the first day in time, became, by the centrifugal impetus which it engendered, the immediate cause of the following stupendous effects:—the heaving of the previously-prepared *primary* and *secondary* formations; the elevation of the continental ridges, and the depression of oceanic hollows for the reception of the primitive circumfluent waters; the locating of animal and vegetable remains, now found fossilized in situations where they could not have existed when *recent*; with many other important phenomena. That while the waters were in agitation and dispersion by the centrifugal impetus, the *expansive principle*, emanating from LIGHT, was combined with elements held in solution by the waters, and made to form the atmosphere; and the earth was made to produce the several objects of the vegetable kingdom. And finally, when all things on the earth had thus been prepared for the introduction of the higher tribe of animals possessing powers of free locomotion, and of man, they were created in their respective orders, and from thenceforth became its permanent inhabitants.

DYNAMOM'ETER (v. 625). A variety of instruments for measuring the power of animal or mechanical bodies, and which go under the above name, have been recently invented. For instance; Messrs. Cottam and Hallen, of London, and Mr. R. Clyburn, of Uley, have constructed dynamometers, which are improvements on those previously in use, as they also register the space through which the power is exerted. But Mr. Reignier's is by far the most effective. It consists of two plates of steel, of a curved form, increasing in thickness towards the ends, which unite in two solid cylindrical loops; the curved sides of the plates being placed opposite to each other, and the whole forming an entire elliptic spring. On the application of this instrument as a *link* in the line of draught, the oval becomes lengthened in proportion to the degrees of force acting on the loops in opposite directions, and the curved sides approach more nearly towards each other accordingly. The degree of approximation in the plates is shown on a scale in divisions corresponding to half and whole hundredweights, by means of a brass rod secured to one plate, acting on a crank attached to the opposite one, thus communicating its effect to the lever index, which, moving over the divisions of the scale, marks the varying degrees of force exerted each moment by the draught to which the instrument is subjected. (Simmonds' *Dictionary of Trade Products.*)

DYNAS'TIDÆ (Gr. *δυνάστης* a ruler), a family of Coleopterous insects (the *Scarabæidæ*), which are remarkably large and powerful. They burrow in rotten timber, on which they feed, and sometimes in the ground.

DYS'ADILE (Gr. *fetid*), a mineral found in secondary limestones in Sicily, near Syracuse. It is extremely fragile, and emits a fetid odour when burnt; whence its name. It occurs in masses of a yellowish colour, either laminated or compact. Its specific gravity is 1·143.

DYS'CLASITE (Gr. *double-fractured*), a mineral found in the Feroe Islands, which occurs in transparent white masses, with an opal appearance. Its constituent parts are—silica, 57·69; lime, 26·83; water, 14·71; soda, 0·44; oxide of iron, 0·32; potash, 23; oxide of manganese, 0·22: and its specific gravity, 2·362.

DYSORNITH'IA, a genus of birds, of the family *Corvidæ*, belonging to the Jays, or *Garrulinæ*.

E.

EAGLE (v. 660). We have already shown, on the authority of Xenophon, Pliny, and Tacitus, that the adoption of the eagle, as a royal banner, or national standard, was of high antiquity, and early adopted by the Persians, Egyptians, Syrians, and Romans:—

> 'Learning and Rome alike in empire grew,
> And arts still flourished where her EAGLES flew.'

The regal successors of the Romans preserved the same emblems. The sovereigns of the Eastern Empire assumed a golden eagle, while those of the Western Empire adopted the black one. When Charlemagne became master of Rome and the whole German Empire, he added, A. D. 802, a second eagle, in order to denote the union of the Empires of Rome and Germany in his own person. Thus we find that the eagle, being the emblem of strength and courage, has been universally preferred as an ensign of sovereignty; and almost every State, which has been entitled to the designation of empire, from the period of the Romans, has adopted the eagle for its national banner; as Austria, Poland, Russia, Prussia, and France. When the two-headed eagle has been assumed, it is indicative of double empire, as in the case of Charlemagne. Thus the emperors of Germany, who considered themselves as the suc-

cessors of the Cæsars of Rome, and the representatives of the Western Empire, as typified in the 'Holy Roman Empire,' always used the double-headed eagle; and this custom was continued by the emperors of Austria, who still looked upon themselves as the representatives of the German Empire, even after Bonaparte had deprived them of their imperial title, as Emperors of Germany.

The emblem of the eagle has been transferred, in modern times, to the coinage of the United States; the *eagle* being their principal gold coin, and a legal tender for ten dollars. Since 1843 this coin weighs 258 grains $\frac{9}{10}$ fine, and contains 232½ pure gold; being equal to 2*l.* 1*s.* 1½*d.* sterling. There are also half and quarter eagles in common circulation.

EAGLE-STONE, a variety of clay-ironstone, so called from its resemblance, as it was imagined, to eagle's eggs; and the ancient opinion was, that it was either formed in, or had dropped from, the eagle's nest. These stones are found of a nodular or kidney shape, and generally contain a loose kernel.

EARTH (v. 658). The history of the earth's crust (to adopt the language of Pliny) is the 'History of Nature.' 'We cannot survey the crust of our planet (says Humboldt) without recognising the traces of the prior existence and distinction of an organic world. The sedimentary rocks present a succession of organic forms, associated in groups, which have successively displaced and succeeded each other. The different superimposed strata thus display to us the faunas and floras of different epochs. In this sense the description of nature is intimately connected with its history; and the geologist, who is guided by the connection existing amongst the facts observed, cannot form a conception of the present, without pursuing, through countless ages, the history of the past.' Thus the study of the material world renders this reflection on the past peculiarly striking, by displaying, in the process of formation, rocks of eruption and sedimentary strata, similar to those of former ages. 'If I may be allowed,' says this distinguished naturalist, 'to borrow a striking illustration from the geological relations by which the physiognomy of a country is determined, I would say that domes of trachyte, cones of basalt, lava-streams of amygdaloid with elongated and parallel pores, and white deposits of pumice, intermixed with black scoriæ, animate the scenery by the associations of the past which they awaken—acting upon the imagination of the enlightened observer like traditional records of an earlier world. Their form is their history, and that of the earth's crust.' [DEPOSITS; FORMATIONS; COAL; DYKES, ETC. *Suppl.*]

But with all our eager investigations, we are left in the dark as to the interior structure of this terraqueous ball. We can only judge by analogy from the various superpositions of mineral strata; and beyond these limits all is as much unknown as the interior of the other planets of the solar system. The open strata being alone accessible to us, we can only judge of the entire mass of the earth and its mean density by comparison and analogy. Thus we can determine nothing with certainty (says Humboldt) as regards the depth at which the geological strata must be supposed to be in a state of softening or liquid fusion, of the cavities occupied by elastic vapour, of the condition of fluids when heated under an enormous pressure, or of the law of the increase of density from the upper surface to the centre of the earth.

EAST INDIA COMPANY (v. 670-74). During the session of 1858 a bill was brought into Parliament for remodelling the government of India, and investing the political power entirely in the hands of the British Sovereign and her ministers. The object of the measure was to remove the inconvenience of double government; the checks and counterchecks of which were frequently so multiplied as to paralyse immediate action. The alterations chiefly consisted in the establishment of a President and Council, the former to be a member of the cabinet, and the latter to be nominated by the crown or otherwise for a certain period. The president is on the footing of a secretary of state. All appointments now made by local authorities continue so to be made. Writerships continue open to competition; cadetships are in the gift of the president and council. The final appointment of both depends on their efficiency in India. In case of any orders being given by the council which involved the commencement of hostilities, they must be communicated to Parliament.

According to a parliamentary return, issued in February 1858, giving an estimate of the receipts and disbursements of the Home Treasury of the East India Company, the receipts between the 1st of January and the 30th of April, 1858, were estimated at 5,156,023*l.*; thus leaving a balance over the disbursements of 859,958*l.* The receipts from the 1st of May, 1858, to the 30th of April, 1859, were estimated at 11,186,026*l.*; this sum including a deficiency balance of 7,586,068*l.* [HINDOSTAN, *Suppl.*]

EASTLAND COMPANY, a trading association of merchants, incorporated in the 21st year of the reign of Queen Elizabeth, and empowered to trade to all places within the Sound, except the Russian port of Narva. The company were formerly called the Merchants of Elbing, from a town in Polish Prussia, to which they chiefly resorted in the infancy of their commerce. After the trade to Sweden and Norway was thrown open to private merchants by Act of Parliament, the company lost its importance.

EAU-DE-COLOGNE (Fr. *water of Cologne*), an alcoholic liquid perfume, originally manufactured at Cologne; for which Dr. Ure gives the following recipe as a good substitute:—'Take alcohol one pint; of the oils of bergamot, orange-peel, and rosemary, one drachm each; bruised cardamon seeds, one drachm; orange-flower water, one pint; distil one pint from a water-bath.' As to the veritable Jean Marie Farina, who makes the real Eau-de-Cologne, there is a curious contest existing in Germany. It was carried on even in the Crystal Palace in 1851, where there were four Farinas, all claiming to be the original. In one of the jury reports of that Exhibition it was stated that 'speculation is carried to so high a

pitch in Cologne, that any child, entitled to the surname of Farina, is bargained for as soon as born, and christened Jean Marie; at times this event is even anticipated.'—*Eau-de-Javelle* (Fr.) is a bleaching liquid, the aqua alkalina oxymuriatica.—*Eau-de-Luce* (Fr.) is a volatile preparation, made thus:—Dissolve ten or twelve grains of white soap in four ounces of rectified spirit of wine; strain the solution; then add a drachm of rectified oil of amber; and let the whole be filtrated. Mix with the solution some strong volatile spirit of sal ammonia.—*Eau-de-Rabel* (Fr.) consists of one part of sulphuric acid to three of rectified spirit of wine.

EBUR'NA (Lat. *ebur* ivory), a genus of univalve mollusca, with a smooth shell, and sutures generally grooved. *Eburninæ* constitutes a subfamily of the Turbinellidæ, in which the shell is generally grooved round the suture, and the body whorl ventricose.

ECCLESIASTICAL COURTS (v. 632-4). In 1858 some important changes came into operation for the administration of those matters which had hitherto been subject to the jurisdiction of the ecclesiastical courts. New tribunals have been established for the disposal of cases of marriage and divorce, and also for the administration of wills, or the distribution of the effects of deceased individuals. So that the jurisdiction of these courts, except in matters of very minor or local importance, may be considered as annihilated. The new court for 'Divorce and Matrimonial Causes' now takes cognizance of those suits heretofore committed to the ecclesiastical courts. Instead of prelatical or clerical judges (who have proved themselves so unfit for the administration of English law), the present judges are the Lord Chancellor, the Lord Chief Justice of the Court of Queen's Bench and Common Pleas, the Lord Chief Baron of the Exchequer, the senior puisne judges for the time being in each of the three last-mentioned courts, and the judge of the new Court of Probate, who is the judge ordinary of the newly-appointed tribunal. The legal erudition, however, of Doctors' Commons, and of the old ecclesiastical courts, is here grafted on that of the common law courts of Westminster. Proctors, advocates, attorneys, and barristers are here allowed to practise; and as far as regards the taking of evidence and trial by jury, the rules of the equity and common law courts are to be followed. [DIVORCE AND PROBATE, COURTS OF.]

ECHELO'N (Fr. *echelle* a ladder), in military tactics, the position of a regiment or army in the form of steps, or with one division more advanced than another. In this formation the successive divisions are placed parallel to one another, but no two on the same allignements, each division having its front clear of that in advance, so that by marching directly forward it can form line upon it. This movement is frequently used for changes of position, or for taking up a new front, in the presence of an enemy.

ECHENE'IS, a genus of fishes (the Remora tribe), belonging to the family *Discoboli*. They have elongated bodies, and are remarkable for having a flattened disk on the head, composed of a certain number of transverse cartilaginous laminæ, by which they are enabled to attach themselves to rocks, ships, or other bodies.

ECHI'NUS (Gr. ἐχῖνος a hedgehog), a genus of the *Echinodermata* (sea-urchins), which have the body covered with a calcareous crust, composed of angular pieces perforated with holes for the transmission of the membranous feet. In Botany, it is the name of a genus of prickly plants, of the order *Euphorbiaceæ*.

EDGEWORTH, MARIA, the celebrated Irish novelist, was the daughter of Richard Lovell Edgeworth, and born in Oxfordshire in 1766. Her numerous works, many of them written in conjunction with her talented father, have perhaps been more instrumental in promoting the cause of education and pure morality, and in the inculcation of refined taste, than those of any other contemporary writer; and amid the ever-varying tastes of the age, her productions still continue to be read and admired. She commenced her literary career about 1800; and the celebrated 'Essay on Irish Bulls,' which was the joint production of herself and her father, made its appearance in 1801. This was soon followed by other works, that did not fail to attract public attention; as 'Castle Rackrent,' and 'Belinda,' which abound with admirable sketches of Irish character and manners. In 1804 appeared her 'Popular Tales,' and in 1806 she published the novel of 'Leonora.' In 1809 she brought out a work of more powerful and varied cast than any of her previous productions, entitled 'Tales of Fashionable Life.' In 1812 she issued her 'Fashionable Tales,' in three volumes, which fully sustained the literary reputation she had now so deservedly acquired. In 1814 appeared her novel of 'Patronage.' During the subsequent period of her life she continued to devote herself to literary composition. She died in 1849.

EDHILIN'GI, among the Anglo-Saxons, the title conferred on the upper classes of society, equivalent, in some respect, to the nobility of the present day. The second class, consisting of freemen and landed gentry, were designated *Frilingi;* and the third class, comprehending the lower orders and labourers, born to servitude, received the appellation of *Lazzi*.

EDINBURGH-SHIRE (v. 701). According to the census of 1851, the population of this county was 259,435; and the number of inhabited houses, 20,946. The population of the principal places was as follows:—

Dalkeith	pa. 6,531	Leith	pa. 33,418
———	t. 5,086	——	bor. 30,919
Edinburgh	160,302	Musselburgh	7,092
		Portobello	3,497

ED'INGTONITE, a scarce mineral found in the Kilpatrick hills of Dumbartonshire, and so called from Mr. T. Edington, of Glasgow. It is a hemi-pyramidal variety of felspar, and occurs in small but distinct translucent crystals. Its specific gravity is 2·7: and it is composed of silica, 39·09; alumina, 27·69; lime, 12·68; water, 13·32; alkali, 7 or 8.

EDUCATION (Lat. *educo* to lead forth) is the means by which the human mind is gradually enlightened, or the physical powers called into useful action. Intellectual education embraces the moral and religious systems of society, by which the mental faculties are improved through the acquisition of useful knowledge. Physical education is the proper training of the bodily organs for the due performance of the labours or active duties of life. The first is the result of study or scholastic tuition—the second, of industrial or artistic training; both of which are highly essential, and indeed absolutely necessary, to the well-being of society. For we find that among the earliest nations of antiquity, (the Persians, Cretans, Greeks, and Romans,) the education of the people, both mentally and corporeally, was considered of the highest importance to the State, and absolutely essential to its political existence. In Greece, especially, the education of youth was more cultivated than in any other nation. In the study of their native language and of the general principles of moral philosophy, the Greeks were aided by the grammarians and philosophers of Athens, who taught them the beauties of their own tongue, and the advantages of ethical knowledge. In their physical training, the youth of Greece were regularly taught by the masters of the Palæstræ, from whom they acquired that activity and address of body, which rendered the Greeks, in all ages, the admiration of the world.

In the Middle age, education was almost exclusively confined to the clergy, or the wealthiest classes of society; and it is a mortifying reflection, that in our own country, even to the present day, the progress of education among the humbler classes has been remarkably slow. It appears that in England and Wales, out of nearly five millions of children between the age of three and fifteen years, little more than two millions attend any school whatever; and of these, only 600,000 are above nine years of age. In fact, only about one child out of every eight remains at school after eight or nine years of age. What, then, is the cause of this social evil? It is worthy of inquiry. Although a great impulse has of late been given to the progress of education, still we find that, during the early period of the present century, it was treated with cold indifference by the aristocracy and the government. The plebeian classes were almost exclusively the promoters of that little school learning which is found to exist. Who, for instance, introduced the Sunday School—the Infant School—the Lancastrian, the National, and the Ragged Schools. Raikes, of Gloucester, a humble newspaper editor, upwards of a century ago, established Sunday Schools. Dr. Bell, of St. Andrews, was the founder of the National Schools; and Joseph Lancaster, who died in poverty, was the first to introduce the Lancastrian School in the Borough Road, Southwark, which has formed the model of numerous others. Mr. Owen, ycleped 'the philanthropist,' was the founder of an Infant School, which, as far as it extended, was productive of much social benefit. Pestalozzi was also partially successful in introducing a system infinitely better calculated than the old existing ones to adapt the minds of the rising youth to the duties of every-day life—to teach the utilities instead of the mere formulas and dogmas of the schools. Yet Pestalozzi shared the fate of thousands who have devoted their minds and energies to the intellectual amelioration of the human family.

In defiance of these laudable efforts, on the part of a few comparatively obscure individuals, in what state have we found the masses of the labouring community? Exactly as any rational man would expect. The grossest ignorance, and its usual concomitants—depravity and crime. With the exception of unhappy Ireland, hitherto the 'Inferno' of ignorance and crime, (thanks to her aristocracy and her priesthood,) England presents a more dismal picture of brutal ignorance, both in her manufacturing and agricultural districts, than in any other part of civilized Europe. The educational system of Germany need only be contrasted with that of England, to make us alive to the discreditable state in which our labouring population may be found.

In a charge lately delivered by Judge Coleridge at Devizes, his lordship observed that out of 428 prisoners only thirty-two could read and write decently, and that 'reading and writing imperfectly was no education at all.' A select committee of the House of Commons, in 1838, declared that to the neglected education of the working classes was to be chiefly attributed the great increase of criminals, and consequently of cost to the country. In confirmation of this, it appears that in twenty years, from 1810 to 1832, the committals of criminals augmented fourfold, while the population increased only 32 per cent.; and the increase in 1840, as compared with 1839, was 11·22 per cent.

In the agricultural districts, where the landed gentry and the clergy might exert a beneficial influence, the state of education has been most deplorable. The Central Society of Education reported, that in eight agricultural parishes near Maidstone, in Kent, there were 728 out of 1300 who never went to any school; and out of 2440 children of the Hay Union, in Herefordshire, only 612 could read or write.

In the manufacturing and populous districts, where it might be presumed, if the government did its duty, that local schools would be generally established, we find a deplorable absence of education. According to the Diocesan Board of Education for Lancashire, it appears that in the Macclesfield district, including a population of 129,541, the number of children educated under the care of the Established Church was not more than 7 per cent. on the gross population; in the Liverpool district 6½; and in the Manchester district 5½ per cent.

It is true that the British Government, within the last few years, has been making some efforts for the more general extension of education among the humbler classes; and we have only to hope that its beneficial effects may soon become manifest; but until education is rendered, in some degree, compulsory on the part of parents and

guardians (as in Germany), and all religious differences laid aside, the wisest intentions may be frustrated. It is certain that the existing evil does not arise from the want of the requisite machinery, nor from the want of funds; for we find that the London establishment of the Public Education Department consists of a secretary with a salary of 1200*l.*; two assistant secretaries, 1800*l.*; eight examiners, whose united salaries amount to 2605*l.*; an advising counsel, 300*l.*; an architect, 400*l.*; forty-one inspectors, at salaries from 200*l.* to 600*l.*; five clerks with aggregate salaries of 923*l.*; and thirty-four assistant clerks, at salaries from 80*l.* to 250*l.* Moreover the public grants, in aid of popular education in Great Britain, since 1847, have been increased four and a half fold; and since 1852 threefold; as will appear from the following tabular synopsis:—

Years.	Annual Grant.
1833 to 1838 . . .	£20,000
1839 to 1841 . . .	30,000
1842 to 1844 . . .	40,000
1845	75,000
1846, 1847 . . .	100,000
1848 to 1850 . . .	125,000
1851, 1852	150,000
1853	260,000
1854	326,436
1855	396,921
1856	451,213

From 1839 to 1854, the number of children, for whom new schools were built, or accommodations extended, was 458,061. In 1855 there was appropriated to the building and enlargement of elementary schools the sum of 71,287*l.*; to books and maps, 2455*l.*; increasing the salaries of certificated masters and mistresses, 44,878*l.*; stipends of pupil teachers, 143,806*l.*; normal schools, 39,960*l.*; inspectors, 30,241*l.*; expenditure on Church of England schools, 239,977*l.*; on Wesleyan schools, 14,975*l.*; on Romanist schools in Great Britain, 13,272*l.*; and on workhouse schools, 9802*l.* The Established Church schools of Scotland received 22,959*l.*; and the Free Church schools, 20,963*l.* During the year 1855 there were new schools built, or extended, for 36,918 children. The number of certificated teachers was 2242 men, and 1190 women; of assistant teachers 221, of whom 48 were women; and the number of teacher pupils, 8524.

From a late educational census, it appears that we have in England and Wales 46,042 day schools, at which 2,144,378 children are educated; 23,514 Sunday schools, educating 2,407,642 children; and 1,545 evening schools, with 39,783 scholars. The total of schools is 71,101, with 4,591,802 scholars. Yet with all these educational means, it is computed that there are 4,908,696 children, between the ages of three and fifteen, requiring education.

It also appears that at the present time the total national expenditure, for the promotion of public education, science, and art (through the Government Education Board, British Museum, the Universities, National Gallery, &c.) may be estimated at about one million sterling. So that if the present deplorable state of uneducated ignorance is allowed to continue, we can only attribute it to the neglect or gross mismanagement of the government authorities.

EFFEN'DI (Turkish, *master*), a title of distinction in the Turkish empire, applied to different officers of rank; particularly to Emirs, priests, and men of learning. *Reis-effendi* is a title given to the grand chancellor of the empire.

EGERTON, MRS., a distinguished actress, who formed a portion of the Kemble school of the earlier portion of the present century; being contemporaneous with Mrs. Siddons, Miss O'Neil, Mrs. Bartley, and other stars of histrionic fame. She was the daughter of the Rev. P. Fisher, rector of Torrington, county Devon, where she was born in 1782. Her first introduction to the stage was at the Bath Theatre, in 1803. In 1810 she appeared at Covent Garden as Juliet, one year after the retirement of the great tragic actress, Mrs. Siddons. Though she appears to have been eclipsed by the brilliant talents of Miss O'Neil, still she was the powerful representative, for some years, of Helen Macgregor, Madge Wildfire, Meg Merrilies, and other creations of Sir Walter Scott's prolific genius. In the well-known melodrama of the 'Miller and his Men,' her performance of Ravina was considered a master-piece of acting. At this period she had become the wife of Mr. Egerton, afterwards the lessee of Sadler's Wells, where she played the heroine, in the drama of 'Joan of Arc,' so effectively that the piece attracted crowded audiences for the whole season.' She subsequently played at the Surrey, Olympic, and Victoria Theatres, of the last of which her husband was lessee; and here she distinguished herself as Queen Elizabeth, in Sheridan Knowles's play of the 'Beggar of Bethnal Green.' Shortly afterwards she retired to private life, and died in 1847.

EKEBER'GITE, a transparent, vitreous mineral, which is found in compact fibrous masses of a greenish, brown, or grayish colour, and so called in honour of M. Ekeberg, who termed it *sodalite*. Its specific gravity is 2·74, and its component parts are—silica, 46; alumina, 28·75; lime, 13·50; soda, 5·25; water, 2·25; and protoxide of iron, 0·75.

ELAP'SINÆ (Lat. *elaps* a kind of snake), a sub-family of serpents, of the family *Coluberidæ*. They are distinguished by their wanting the power to expand the fauces, which arises from the shortness of their mastoidian and tympanic bones.

ELDERS, a term commonly applied to the superintendants or governors of a religious community, somewhat equivalent to the presbyters, bishops, or overseers mentioned in Acts xx. 17, 28. In the early history of the Jews, they are mentioned as the heads of tribes, who, before the settlement of the Hebrew commonwealth, possessed a patriarchal jurisdiction over the people. We find from Exodus iv. 29, that when Moses was sent into Egypt to deliver Israel, he assembled the elders, and treated them as the representatives of the nation; and when the law was given he called them together to be witnesses of the event. Afterwards we find them numbering seventy, or

rather seventy-two, being six from each tribe. We read in Num. xi. 24, that on the murmuring of the people, at the encampment called the Graves of Lust, Moses appointed seventy elders, to whom a part of his spirit was communicated by the Almighty; and this judicial body appears to have continued not only during the life of Moses, but under Joshua and the Judges; and then to have been transmitted to the Christian communities of ancient and modern times. Among the primitive Christians, the leading members of the Church were called Elders; and the appellation is still preserved in the Presbyterian Churches.

ELDON HOLE. [CAVERNS, SUBTERRANEOUS, *Supplt.*]

ELECTRIC CLOCK (Bain's). This is a very ingenious contrivance, which has been described in the fourth edition of 'Novelties, Inventions,' &c. published by Routledge. 'It has no weight, no spring, no escapement, no winding-up apparatus nor necessity for being wound-up, no agency within itself for putting or keeping the hands in motion. The invisible power which actuates it is outside the clock—outside the house even in which the clock is contained. In a garden or other piece of ground is dug a hole four or five feet deep; into this hole is thrown a layer of coke, then a layer of earth, and then a few zinc plates. A feeble but constant galvanic current is generated by the contact of the earth with the coke below it and the zinc above it, without the aid of any other battery; and this current is conveyed in-doors by copper wires. The wires form a coil round a magnet; and the electro-magnet thus formed is made to constitute the bob of the pendulum of the clock. Delicate and beautiful mechanism enables the electric apparatus to give a vibratory motion to the pendulum, and the pendulum in its turn to give motion to the two hands of a clock. The *only* "winding-up" required by this extraordinary clock is a feed of zinc to the earth-battery, *when it* shall have become oxidised by long use; but one of the clocks has been already known to go three or four years without any such chemical winding-up.' This is not 'perpetual motion' certainly, but it is a most instructive approximation towards it.

The mansion of the Duke of Medina Celi, a Spanish grandee, is surmounted by a magnificent electric clock, with several faces, one of which, fronting the saloon, or principal promenade on the Prado, shows the change of the moon, as well as the hours of the day and night. There is also a peal of bells, playing different airs, selected from the most popular Spanish melodies, as often as the hour strikes.

ELECTRIC LIGHT, that dazzling brightness which is produced from small pieces of carbon, rendered luminous by currents of galvanic electricity. It was first exhibited in London in 1846, when a patent was taken out by Messrs. Greener and Staite; and in 1847 the metropolis was astonished by the occasional flashes of intense light which were thrown out from different elevated spots. In order to produce these flashes there were two small cylinders or pieces of pure carbon, with their points placed toward each other at a small distance. 'As they were subjected to a slow combustion,' says the author of 'Novelties, Inventions,' &c., 'the points of these cylinders receded further and further apart; but this recession was connected by a train of wheelwork which advanced them in an equal degree in the opposite direction; so that the carbon points were maintained equidistant. A galvanic battery was provided, and the two carbon cylinders lay in the direction of the circuit through the wires; so that the galvanic circuit could not be completed unless the fluid could traverse the small distance from one piece of carbon to the other.'

It is, however, one of the properties of electricity, that when the subtle agent has thus to leap over the interval, as it were, from one point to another, it generates an intense heat at that point; and the points being, in the apparatus in question, formed of a slowly-combustible body, like carbon, the heat generates, or at least is accompanied by an intense light.

Some practical difficulties have presented themselves, which have not yet been so satisfactorily surmounted as to bring this novel invention into general use; and one principal difficulty is to keep the carbon points at such a distance as to render the brilliant light continuous instead of intermittent; as a mere flickering light, with all its brilliancy, would be comparatively useless. This difficulty, however, appears likely to be surmounted by the discovery of M. de Changy, a description of whose apparatus lately appeared in the 'Progrès International.' It consists of a Bunsen pile of twelve elements (says M. Jobard), with some improvements of his own, which produce a constant luminous arch free from intermittance and crepitation, between two carbon points, kept in position by a regulator. In order to illustrate the effect of his invention, M. de Changy employs a dozen small miners' lamps, so arranged that either one or the other may be lighted up or extinguished at pleasure; and that too without diminishing or increasing the intensity of the light. The lamps are enclosed in hermetically-sealed glass tubes, and are specially intended for use in mines when there is a dangerous amount of fire-damp.

ELECTRIC TELEGRAPH. [TELEGRAPH, xi. 915, and *Supplt.*]

ELEMOSYNA REGIS (Lat. *the king's charity*), a kind of poor-rate, established by King Ethelred among the Anglo-Saxons, by which a penny was ordered to be paid for every plough in England, to the use of the poor; hence it was sometimes called *Elemosyna aratri* (the charity of the plough). In the Middle age the term ELEMOSYNARIUS was applied to the almoner or peculiar officer attached to religious houses, who distributed the eleemosynary gifts to charitable and pious uses.

ELEN'CHUS, a genus of mollusca of the family *Trochidæ*, in which the shell is smooth, the spire elongated, and the body whorl comparatively small.

ELEPHANTI'NI LIBRI (Lat. *ivory books*), among the ancient Romans a series of volumes which embodied the census of the people, with

particulars of their births, deaths, professions, and rank. In these books were also registered the proceedings of the senate, and the transactions of the magistrates, generals of armies, and other public functionaries.

ELF-ARROWS, a peculiar kind of flint-headed arrows, made use of by the ancient Britons as implements of war. They are frequently found in England and Scotland; and appear like flint-stones sharpened on each side in the shape of arrow-heads.

ELGIN, THOMAS BRUCE, seventh Earl of, the distinguished collector of the Elgin Marbles, was born in 1771, and educated at Harrow and Westminster Schools, and afterwards at the university of St. Andrews. He next went to Paris, where he resided for two years, and then prosecuted his military studies in Germany. He received an ensign's commission in the Foot-Guards, in 1785; and after going through the different military grades, he attained the rank of colonel in 1802; of major-general in 1809; of lieutenant-general in 1814; and of general in 1837. In 1790 his lordship commenced his diplomatic career by a special mission to the Emperor Leopold, of Germany. In 1792 he was appointed envoy-extraordinary to the court of Brussels; and in 1795 minister-plenipotentiary to the court of Berlin. In 1799 his lordship was constituted ambassador-extraordinary and minister-plenipotentiary to the Ottoman Porte. It was in this position that he was enabled to rescue the remains of Grecian art from destruction and oblivion, and thus to transmit his name to posterity as the noblest patron of art in modern times. Through the assistance of Signor Lusieri, and other distinguished artists, he was enabled, during the summer of 1800, to form, from Athens, and other places in Greece, a complete collection of architectural measurements, delineations of sculpture, plans of existing monuments, statues, bas-reliefs, &c., of the best periods of Athenian art. He also made a valuable collection of Greek medals, inscriptions, and various specimens of the ancient Greek alphabets. But the most important was the inestimable collection of Grecian sculptures, now deposited in the British Museum, which, in honour of his lordship, have received the appellation of the 'ELGIN MARBLES' (vol. v. 783). An account of the formation of this collection, after they had been brought to England, will be found in the 'Gentleman's Magazine' for 1803, p. 725; and also a defence of their removal from Athens, in the volumes for 1810 and 1813. After various negotiations with the British Government, it was agreed that they should be purchased for 35,000*l*. They were deposited in the British Museum; and it was arranged, at the same time, that the Earl of Elgin and his heirs should be included among the family trustees of that great national establishment.

His lordship has incurred the censure of Lord Byron, Dr. Clarke, and others, for having removed these glorious monuments of Grecian art from their original site, and even been charged with a mercenary spirit for the manner in which he disposed of them. In answer to the first, it may be said, without fear of contradiction, that within a very few years these precious remains, in the hands of their barbarian possessors, would have been consigned to destruction; and therefore his lordship has been instrumental in rescuing them from the ravages of time and neglect. As to the second charge, of his lordship having been actuated by a mercenary spirit, it was calculated that at the time of the sale of the collection he had incurred an expense of more than double the amount received from Parliament; and that he lived and died an exile in comparative poverty.

In such high estimation were the virtues and talents of his lordship held by his countrymen, that from 1790 he was uniformly elected as one of the sixteen representatives of the Scottish peerage. He died at Paris in 1842, aged 75.

ELGINSHIRE, Scotland (v. 783–6). According to the census of 1851, the population of the county was 38,959; and the inhabited houses 7642. The population of the principal places was as follows:—

Elgin . .	par. 7,277	Forres . .	town 3,468
—— . .	bor. 6,337	Fochabers. .	1,135
Forres . .	par. 4,069	Burgahead . .	829

ELLIOTT, EBENEZER, a self-educated poet, known in English literature as 'the Corn-Law Rhymer.' He was born at Marlborough, near Rotherham, in 1781. His father was a clerk in the iron-works of that place. Our poet's first publication was 'The Vernal Walk,' which he brought out at 17 years of age. Its vivid descriptions of rural scenery attracted attention; and from this period he devoted himself unceasingly to the Muses. He thus became an extensive contributor to the 'New Monthly Magazine,' and other periodicals. Soon afterwards he brought out his poem of 'Night,' and afterwards a volume of poems, with a preface of defiance to the critics; but in this he had little success; although Mrs. Southey prophetically consoled him by writing—'There is power in the least of these tales; but the higher you pitch your tone the better you succeed. Thirty years ago they would have made your reputation; thirty years hence the world will wonder that they did not do so.'

Elliott's next attempt was his poem of 'Love,' to which he prefixed 'The Giaour,' a vehement satire on Lord Byron; but his lordship never condescended to notice it.

At forty years of age, after having failed at Rotherham, Elliott entered into business in the iron trade at Sheffield, in which he was remarkably successful, and was enabled to retire to a handsome villa of his own, in the suburb of Upper Thorpe, where he could write his effusions, and at the same time behold Sheffield smoking at his feet.

The great object of Elliott's political life was the abolition of the corn-laws, which he looked upon as the bane of social industry; and undertook to direct the full virulence of his pen against their existence. Perhaps it is not too much to say that his 'Corn-Law Rhymes,' by which his name will be transmitted to posterity, were as instrumental in fanning the excitement that even-

tually led to the abolition of those iniquitous laws, as any of the elegant speeches of the Anti-Corn-Law League. In 1833-5, his poems appeared in three volumes; and in 1840 another edition was printed in one volume, with additions, which has had a very extended sale.

In 1841 Mr. Elliott retired from business, to spend his last years on his own estate at Great Houghton, near Barnsley, where he died in 1850, aged 68.

ELLORA, a village of Hindustan, situated in lat. 20° 5′ N., and long. 75° 15′ E., celebrated for its stupendous cave-temples, excavated in the vast slope of a hill, and for magnitude and execution surpassing all other structures of the kind in the world. The date of their excavation is unknown. They consist of several temples and buildings formed out of a vast mountain of granite, and extending nearly a mile and a half under ground. Ellora appears to have been for ages one of the principal seats of the Brahmins or Hindoo priesthood; hence it may be safely concluded that these temples were formed for religious or funeral objects. At the opening we have a stupendous temple within a large court-yard hewn out of the solid granite rock, with all its parts perfect and beautiful, and firmly attached to its native bed. The temple is about 100 feet high, 145 feet long, and 62 wide, with all its doorways, windows, staircases, and floorings, perfectly formed; while the surrounding area, which has been excavated from the solid rock, is nearly 250 feet deep, and 150 broad. Beyond this vast area are three handsome figure galleries supported by regular pillars, with compartments containing forty-two gigantic statues of Hindoo mythology. Within the court-yard stands 'Keylas the Proud,' a vast fabric of rock, which is surpassed by no relic of antiquity in the world. There are other temples described by Captain Seely, who some years ago visited these wonderful monuments of Hindoo worship; such as 'Teen Tal,' and the arched temple of Visvacarma,—a work of incredible labour and skill.

ELMO'S LIGHT, the name of a luminous meteor, produced from the electric state of the atmosphere, which is occasionally seen on the mast-heads of vessels. It is so called from St. Elmo, who was formerly supposed to be the tutelar deity of those who traverse the sea, and of whom this meteoric light was supposed to be the prophetic and visible representation. Sometimes it descends the mast, which is considered as a prognostication of disastrous weather. Perhaps there may be some philosophical principle in this, when we consider the facility with which a pointed conductor transfers electricity from a highly-electric atmosphere, and which may be the prognostication of violent atmospheric changes. This remarkable light was seen by Columbus among the West India Islands, which the crew hailed as an assurance of their supernatural protector being near. This great navigator records the circumstance in a manner strongly characteristic of a superstitious age. 'On the night of Saturday,' says he, 'was seen St. Elmo, with seven lighted tapers, at the topmast. There was much rain and great thunder. I *mean to say that* those lights were seen which mariners affirm to be the body of St. Elmo, on beholding which they chanted many litanies and orisons, holding it for certain, that in the tempest in which he appears no one is in danger.' The same phenomenon was also witnessed by Baron Humboldt during one of his voyages, and has been thus described:—'On observing the appearance of the masts, the main-topgallant mast-head from the truck for three feet down was perfectly enveloped in a cold blaze of pale phosphorus light, completely embracing the circumference of the mast, and attended with a flitting or creeping motion, as exemplified experimentally by the application of common phosphorus upon a board. The fore and mizen topgallant mast-heads exhibited a similar appearance. This curious illumination continued with undiminished intensity for eight or ten minutes, when, becoming gradually fainter and less extensive, it finally disappeared, after a duration of not less than half an hour.'

EL'YTRON (Gr. *a sheath*), in entomology, the coriaceous covering, or wing-sheath, that covers the membranous wings of coleopterous and orthopterous insects; as in the Beetle tribe.

EMAIL OMBRANT (Fr. *shaded enamel*), the name of a manufacture which is produced by flooding coloured and transparent glazes over designs stamped upon the surfaces of porcelain vessels. A plain surface is first produced; and after the stamping process the cavities of the design appear as shadows of various depths; and the parts in highest relief coming nearest to the surface of the glaze, all the effects of the light and shade of a picture present themselves. By this process we have porcelain ware presenting designs of high artistic beauty, well calculated for dessert or table services, and produced at a remarkably cheap rate.

EM'ERY (Corundum, iv. 998), is a hard ferrugino-silicious mineral, which, when ground to powder, and used as *emery paper*, is of the greatest utility in the polishing and burnishing of steel works, minerals, marble, glass, and other hard bodies. This material, so important to the mechanical arts, is made by dusting fine emery on paper covered with a coating of glue. When dry it is fit for use. But as glue is soluble in water, this kind of emery paper cannot be used to polish articles in water. To prepare emery for this purpose the paper should be coated with copal varnish, dissolved in hot linseed oil, to which has been added some turpentine containing a little dissolved India rubber. After coating the paper with this composition, the emery is dusted on it in the same manner as on glue. In order to remove stickiness arising from the varnish, the preparation should be dipped in a solution of sulphate of lead, and afterwards dried in a warm place.

EMIGRATION (v. 809-14). Since our last account was published, the spirit of emigration from the United Kingdom has been wonderfully progressive. According to the general census of 1851, the emigration from 1840 to that period, as furnished by the Land and Emigration Commissioners, was as follows:—

Years.	To North American Colonies.	To United States.	To Australian Colonies and New Zealand	To All othe Places.	Total.
1840	32,293	40,642	15,850	1,958	90,743
1841	38,164	45,017	32,625	2,786	118,592
1842	54,123	63,852	8,534	1,835	128,344
1843	23,518	28,335	3,478	1,881	57,212
1844	22,924	43,600	2,229	1,873	70,626
1845	31,803	58,538	830	2,330	93,501
1846	43,439	82,239	2,347	1,826	129,851
1847	109,680	142,154	4,949	1,487	258,270
1848	31,065	188,233	23,904	4,887	248,089
1849	41,367	219,450	32,191	6,490	299,498
1850	32,961	223,078	16,037	8,773	280,849
1851	1,197	53,142	2,962	736	58,037
To March 31 A previous account, from 1825 to 1839, gives . .	380,364	318,127	58,449	3,458	790,398
Making a grand total in 27 years . .	842,898	1,506,467	204,385	40,320	2,624,070

Such was the extent of emigration from this country, as taken at the period of the last census. But from the report of the 'Emigration Commissioners' for 1856, we are put in possession of more recent statistics, which present many interesting details. One of the tables then published shows the progress of emigration, from the close of the Peninsular war to the end of 1855, during which period of forty-one years, no less than 4,293,765 persons left the United Kingdom, and of that number 2,621,609 emigrated during the last nine years. The largest emigration in any one year was in 1852, when it amounted to 368,764. The larger portion of emigrants was from Ireland; the number of Irish who emigrated in 1851 having been 254,537. The estimated emigration from Ireland, between 1841 and 1854, was not less than 2,000,000. It is stated that the sums of money remitted to Ireland, from the American emigrants, since 1848, amounted to 8,393,000*l.*, and during the last three years they exceeded three millions and a half.

There has of late years been an increased tendency to emigrate to the United States in preference to the North American colonies, which were most resorted to prior to 1835.

The emigration to Australia in 1855 was considerably less than the number in 1854; the numbers being respectively 33,237 and 52,309. Assistance was given to the emigration of 41,065 persons in the former year.

The report includes in its notice the emigrants who returned to this country in 1856. The numbers were, from America, 18,402; from Australia, 4419. The greater wealth of the latter, compared with the returning emigrants from America, is inferred from the relative proportion of steerage to cabin passengers. Of those arriving from Australia 16½ per cent. were cabin passengers; whilst of those from America there were only 1½ per cent.

On the whole it appears that emigration from our shores, especially from Ireland, was in a decreasing ratio for the four years preceding 1854. From Ireland there left, in 1851, 254,537; in 1852, 224,997; in 1853, 192,609; in 1854, 150,209; and in 1855, 78,854. Thus, while in England the decrease in the general emigration, in 1854, amounted to 12·29 per cent., and in 1855 to 52·02 per cent., the decrease in the Irish emigration amounted to 33·23 and 64·95 per cent. during the same periods; and not only much fewer persons left the United Kingdom in the years 1855 and 1856, but a remarkable portion of those who have left seemed to be returning.

The result of the large amount of emigration, which in fourteen years drove from Ireland no less than 2,000,000 of souls, has, in many respects, been productive of great benefit to the overpopulated districts; by rendering labour more remunerative to those who remain. As the Commissioners very justly say, 'No country could continue such an efflux of its population, without reducing the number so low as to add very sensibly to the value of the labour that remained behind. And accordingly we find the officers employed under the Poor Law Commissioners in Ireland unanimous in testifying to the improvement of the condition of the labouring population.'

Of the 4,212,624 emigrants who arrived in the United States from the year 1819 to the end of 1855, it appears that 2,343,445 were born in the United Kingdom; and 1,747,930 of these are believed to be Irish. To this vast tide of emigration Germany has contributed 1,242,082; France, 188,725; Switzerland, 31,071; and Norway and Sweden, 29,441. The year 1854 afforded the largest emigration. During 1857 the number of emigrants to the United States was 271,982; being 41,500 more than in 1855, and 47,486 more than in 1856. The number who landed at New York, during 1857, was 185,847, of whom 29,502 were from England, 62,098 from Ireland, 5063 from Scotland, and 910 from Wales; and from Germany, which is highest on the list, 78,800.

During the heat of the Russian war (1854–6), which opened various channels of employment, the spirit of emigration was checked; but in 1857 the human stream again began to pour forth from the British ports with much greater strength. During the first six months of 1857, no fewer than 96,770 emigrants left Liverpool, which was 36,084 more than in the same period of 1856.

In the meantime the Government Emigration Commissioners, of Park Street, Westminster, are affording every encouragement to those intending to emigrate to our Australian colonies, where the scarcity of labour renders an accession of British industry so desirable. For this purpose the Commissioners have received large sums of money from the Australian colonies, for enabling persons to emigrate at moderate fares; and accordingly they have issued a scale of the amount of passage-money required from the different kinds of labourers, and intimating, at the same time,

that there is no payment for wives, or for children under fourteen years of age accompanying their parents. From married agricultural labours, herdsmen, shepherds, and gardeners, journeymen masons, bricklayers, blacksmiths, wheelwrights, sawyers, carpenters, and copper-miners, under forty-five years of age, the passage-money is 1*l.*; from those between forty-five and fifty years, 2*l.*; and from those between fifty and sixty years of age, 5*l.*; from single men, not exceeding forty years of age, 1*l.*

EMPSON, WILLIAM, Professor of Law in Haileybury College, and Editor of the 'Edinburgh Review,' was born in 1791. He was educated at Winchester School, and Trinity College, Cambridge. He first entered on the literary arena of life as a contributor to the 'Edinburgh Review,' in 1823, when Francis Jeffrey (afterwards lord) was engaged in the editorship. On Jeffrey resigning his post, in 1829, Empson, who afterwards married his lordship's only daughter, was appointed the third editor; and he continued ably to contribute to the 'Review,' till 1849, on the different subjects of law, domestic polity, poetry, biography, education, religion, and general literature. At Haileybury he succeeded to the chair which had been occupied by that eminent jurist, Sir James Mackintosh. In this important position, Professor Empson's object was to impress on the minds of his pupils the great fundamental principles of ethical science and the general laws of nations; and especially with relation to the laws and government of our great Indian empire. Empson was in constant correspondence with Lord Jeffrey, Sir James Mackintosh, and other distinguished political characters of the day. Many of these letters are dated from Haileybury, and are replete with literary and historical interest. He died in 1853.

EMY'DÆ, in zoology, the family of River Turtles, belonging to the order *Chelonides*. The feet are palmated, with five claws on the fore, and four on the hinder ones; the jaws horny, and the body covered with horny plates.

ENALIOSAU'RIANS (Gr. ἐν in, ἅλς the sea, and σαῦρος a lizard), in geology, a class of extinct marine saurians, of which fossil remains are occasionally found. They appear to have been furnished with the head and trunk of a crocodile, and with paddles like those of a whale.

ENCEINTE, in fortification, the inclosure of a place, or the rampart which surrounds it, and which is sometimes flanked by round or square towers.

ENCEPHALEZOA'RIA (Gr. *headed animals*), in zoology, that division of the animal kingdom, which comprehends those animals possessing two nervous systems, the ganglionic and the cerebro-spinal.

EN'GEDITES, a family of coleopterous insects, in which the body is oval or elliptical, and the elytra completely cover the abdomen.

ENGINEERS, MILITARY (v. 835-7). In the British army, there is a corps of Royal Engineers, consisting of officers of all ranks, from the colonel to the second lieutenant, with a body of men, termed sappers and miners. In the construction of fortifications, trenches, and batteries, as well as in attacking and defending fortified works, this corps is of essential importance. The officers are presumed to be well acquainted with every department of mathematical and mechanical science, and to be able at any time to bring their knowledge into practical application. They are educated at the Royal Military Academy, at Woolwich, or at Addiscombe Seminary in Surrey; the one for the Queen's service, and the other for the service of the East India Company, so long as their charter continued to exist. At Woolwich they are nominated as cadets by the master-general of the ordnance; and on passing their examinations are selected for commissions. They then rise, by regular gradation, from the rank of second lieutenant to that of colonel. Their pay is as follows: — col.-commandant, 1000*l.* per annum; colonel, 1*l.* 6*s.* 3*d.* per day; lieut.-col. 18*s.* 6*d.* and 16*s.* 1*d.*, according to grade; captain, 10*s.* 1*d.*; first lieutenant, 6*s.* 10*d.*; second lieutenant, 5*s.* 7*d.*; adjutant, 10*s.*; brigade-major of sappers, 9*s.* 6*d.*; quarter-master, 8*s.*

In the Engineering Corps of Her Majesty's service, the commissions have never been purchaseable, as in the Guards or in the Line; but the officers have been selected from the most promising pupils of the Military College. Yet the nominations, until within the last two or three years, chiefly depended on patronage. But a fairer and more impartial system of selection at the present time prevails. A public examination takes place about the month of January, when the number of youthful candidates are selected by competition. Previous to examination each candidate must transmit to the War Office the following particulars:—1st. An extract from the register of his baptism, or in default of that, a certificate verified by affidavit. 2nd. A certificate of good moral character, signed by a clergyman of the parish to which he belongs, and by the tutor or head of the school or college, at which he has received his education, for at least two years; or such other proof of good moral character, as will be satisfactory to the secretary of state. 3rd. A statement of the subjects of examination, in which (in addition to mathematics) he may desire to be examined. Those candidates who happen to be successful then remain under the instruction of the Academy until they are sufficiently advanced in scientific knowledge to pass a satisfactory examination, when in the usual course they receive commissions in the Royal Engineers or Artillery.

ENGLAND. [For Population returns, &c., *see* GREAT BRITAIN, *Suppl.*]

ENGLISH LANGUAGE. The English language (says the editor of the 'Improved Edition of Walker's Dictionary') was originally formed from the languages spoken by various tribes from the north of Germany, who settled in this country in the fifth and sixth centuries. The principal of these were the Jutes, the Saxons, and the Angles. Soon after the arrival of these settlers, the aboriginal Britons were driven into the mountainous parts of Wales, where their language (the Welsh)

continued to be spoken, while that used in the southern part of Britain was formed from the amalgamation of the various dialects of the invaders, and called the Anglo-Saxon language, the country being called *Angle-land*. At subsequent periods the language received various additions from the Gothic, Latin, and French tongues; to which its wonderful copiousness may be attributed. But dictionary English (says a contemporary critic) is very different from that in colloquial use, or from that of ordinary written composition. Instead of about 40,000 words, there is probably no single author in the language, from whose works, however voluminous, so many as 10,000 words could be collected. We should be surprised to find, if we counted them, with how small a number of words we manage to express all that we have to say, either with our lips or even with the pen. Our common literary English probably does not extend to 10,000 words; our common spoken English hardly to 5000. And the proportion of native or home-grown words is undoubtedly very much greater in both the 5000 and the 10,000 than it is in the 40,000. Perhaps of the 30,000 words, or thereabouts, standing in the dictionaries, that are very rarely or never used even in writing, between 20,000 and 25,000 may be of French or Latin extraction. If we assume 22,500 to be so, that will leave about 5000 Teutonic words in common use; and in our literary English, taken at 10,000 words, those that are non-Roman will thus amount to about one-half. Of that half, 4000 words may be current in our spoken language, which will therefore be genuine English for four-fifths of its entire extent. It will consist of about 4000 Gothic and 1000 Roman words.

ENTOMOPH'AGA (Gr. ἔντομα an insect, and φάγω to eat), a family of marsupial quadrupeds, comprehending opossums, bandicoots, and the genera *Chœropus* and *Myrmecobius*, some of which feed upon insects. The tribe is characterized by having molar, canine, and incisor teeth.

ENTOMOS'TEGA (Gr. ἔντομα an insect, and στέγη a covering), a family of minute Cephalopods, in which the cells are subdivided by transverse septa.

ENTOMY'ZA (Gr. ἔντος within, and μύζω to suck), a genus of birds, of the tribe *Tenuirostres*, belonging to the family *Meliphagidæ*, or Honey Suckers.

EN'VELOPE, in fortification, a mound of earth thrown up, either in the shape of a small parapet, or in the more extended form of a rampart. Envelopes are occasionally *en zig-zag*, and intended to inclose a weak position. They are sometimes raised in the ditch of a fortified place as a check to the enemy in case of assault, and then they are called by different names; as lunettes, contregardes, sillons, &c. (*Military Cyclopedia.*)

ENVELOPE MACHINE, a very ingenious contrivance for the manufacture of envelopes, which, since the Post Office reform of 1840, have been universally adopted for the inclosure of letters. Different modifications of these machines have been adopted. A very elegant one was some time ago invented by M. Rémond. Diamond-shaped pieces of paper having been previously cut into the required sizes by means of a powerful cutting implement, are placed in a heap by the side of the machine; a hollow tube then thrusts itself forward, and rests upon the uppermost piece of paper; at the same instant, a small air pump draws the air from the tube, and the topmost paper clings by atmospheric pressure to two minute holes on the lower surface of the tube. The tube then withdraws itself, drops the paper exactly in the spot where the folding and gumming mechanism is placed, and travels forth in search of another. But perhaps the most effective machine is one invented by Mr. De la Rue, the extensive wholesale stationer, which can make as many envelopes as nine expert women, or about 25,000 per day. Its operations are performed with unerring accuracy. The diamond-shaped piece of paper, just described, is placed by a boy or girl on a flat surface board; when (as described by the author of 'Novelties, Inventions,' &c.) 'a sort of plunger descends, and forces the central part of the paper into an oblong quadrangular cavity; the four corners stand erect, and these are successively flattened by four levers, fingers, or thumbs, whereby the envelope form is given. When all is done, two India rubber fingers lightly touch the envelope, and delicately draw it aside, to make ready for another. These fingers are small metallic cylinders, with bits of India rubber at the lower ends; they have just enough of the glutinous or sticky quality to adhere slightly to the paper on which they are pressed, and to draw it away from its place in the machine. But while these processes have been going on, there is another series also in operation to effect the gumming or fastening. There is a supply of gum, which spreads itself over an endless apron or blanket; and an artificial arm takes a supply of gum from this blanket, to apply it to the envelope. All these movements are so nicely adjusted, that the gum is applied in its proper place just before the flap of the envelope is folded down. As fast as the envelopes are made, they range themselves on an inclined plane, with the precision of well-drilled soldiers, and slide up into a box prepared for their reception.'

EPHA, or EPHAH, among the Hebrews, a measure of capacity, which held sixty pounds avoirdupois of water; but the *epha* of the sanctuary was one-third larger.

EPHE'TÆ, the name of certain Athenian magistrates, fifty in number, whose principal duty was to take cognizance of murders committed by accident. They possessed numerous privileges, and were superior to the Areopagites; but Solon reduced their power, and limited their duties to trials for manslaughter, and conspiring against the life of a citizen.

EPHOD, a kind of girdle, or short cloak worn by the Jewish priests, which passed from behind the neck over the two shoulders, and thus hung across the stomach. There were two sorts, one for the common priests, made of plain linen, and another embroidered, for the high priest, composed of gold, and blue or crimson twisted cotton. On that portion which came across the shoulders

were two precious stones, with the names of six tribes engraven on them; but where the ephod crossed the breast there was a square ornament, set with precious stones, on each of which the name of one tribe was engraven.

EPIGLOTTIS (Gr. *on the tongue*), in anatomy, an elastic and flexible cartilage of the larynx, situated above the glottis. Its use is to prevent the introduction of the food into the windpipe during the act of swallowing, at which time it closes over the larynx, and allows the food to pass over it into the œsophagus.

EPIPALLA'DIO, among the early Greeks, a court of judicature, first instituted in the reign of Demophoon, the son of Theseus, for the purpose of trying those who were guilty of accidental or involuntary murder. The courts of the EPHETÆ (which see) are supposed to have originated from the establishment of this tribunal.

EPIPLO'ON (Gr. *floating upon*), in anatomy, the caul or omentum, so called from its floating on the intestines.

EPISCOPA'LIA (Lat. *episcopus* a bishop), in the Middle age, were certain payments made by the clergy to their diocesan or bishop. They were collected by the rural deans, and by them paid to the bishop. (Kennet.)

EPIS'OMITE, in mineralogy, the native sulphate of magnesia, which occurs in crystalline fibres in the gypsum quarries of Montmartre, near Paris; and also in the old coal mines near Paisley, and Duntocher, in Dumbartonshire.

EPIS'TATES (Gr. *a president*), among the Athenians, an officer of great political importance, chosen by lot out of the *Prædri*. He held the keys of the treasury, and kept the public accounts; and a portion of his business consisted in giving the people the signal for voting, and compelling them to attend at public assemblies.

EPISTIL'BITE (Gr. ἐπὶ, and στιλβὸς shining), a mineral which occurs in spotted crystals of a yellow or whitish colour, and is chiefly found in Iceland and the Faroe Islands. Its specific gravity is 2·2 to 2·25. It consists of silica, 58·59; alumina, 17·52; lime, 7·56; soda, 1·78; and water, 14·00.

EPIS'TYLA (Gr. ἐπιστύλιον a pillar), a genus of the *Helicinæ*, or common Land-snails, and of the family *Helicidæ*. The shell is very thick and conical, and the whorls very numerous.

EPULO'NES (Lat. *epulum* a feast), an order of priests, among the ancient Romans, whose duty it was to furnish banquets for the gods at the religious festivals, or on the birth-day of the emperor. The feast at which they ministered was called *epulum*.

EQUES'TRIAN GAMES, horse-races among the Romans, of different kinds, as the *podromus*, or simple horse-race, the decursory race around funeral piles, chariot races, the Neptunian games, &c.

EQUINOX'ES (v. 889; ix. 818). The *Precession of the Equinoxes* is one of the most interesting problems connected with astronomical science; and which can only be satisfactorily accounted for by the supposition that the sun itself, with all his revolving orbs, is in constant motion, and describing some great circle in the heavens, which he performs, according to the usual calculations, once in about 25,000 years. The history of this discovery can be traced back for upwards of 2000 years. By a series of observations made at Alexandria, between the years 161 and 127 B.C., Hipparchus found that the point of the autumnal equinox was about six degrees to the eastward of the star called Spica Virginis. Eager to determine everything by multiplied observations, he ransacked all the Chaldean, Egyptian, and other records, to which his travels could procure him access, for observations of the same kind. He found some observations of Aristillus and Timocharis, made about 150 years before. From these it appeared evident that the point of the autumnal equinox was then about eight degrees east of the same star. He discusses these observations with great sagacity and rigour; and on their authority he asserts that the equinoctial points were not fixed in the heavens, but moved to the westward about a degree in seventy-five years. This motion is called the 'Precession of the Equinoxes,' because by it the time and place of the sun's equinoctial station precedes the usual calculations. It is fully confirmed by all subsequent observations. In 1750 the autumnal equinox was observed to be 20° 21′ westward of Spica Virginis. Supposing the motion to have been uniform during this period of ages, it follows that the annual precession is about 50¼″; that is, if the celestial equator cuts the ecliptic in a particular point on any day of this year, it will, on the same day of the following year, cut it in a point 50¼″ to the west of it, and the sun will come to the equinox 20′ 23″ before he has completed his round of the heavens. Thus the equinoctial or tropical year, or true year of the seasons, is so much shorter than the revolution of the sun or the sidereal year. (Craig.)

ER'EBUS, MOUNT, an active volcano, of immense size, on the South polar continent.

ERETHRI'NA, the coral tree, the flowers of which are of the deepest and most brilliant crimson, and appear in profusion upon some of the loftiest trees of tropical forests.

ERIN'NYS (Gr. *discord of the mind*), in mythology, one of the Eumenides, or Furies.

EROTYLI'DÆ (Gr. ἐρωτύλος amatory), a family of one-horned coleopterous insects, with a gibbous body and long legs, and characterized by having an enlarged knob to the antennæ.

ERPICHTHYS (Gr. ἕρπω to creep, and ἰχθὺς a fish), a genus of fishes, of the family *Blennidæ*, or Blennies, in which the canine teeth are generally wanting, and the dorsal fin but slightly emarginated.

ERRAN'TES (Lat. *errans* wandering), a family of *Annelides*, which generally live beneath stones, or in the sand of the sea. Each ring of their body bears a pair of feet, and they walk and swim well. There are several tribes and genera of this family.

ERRATIC ROCKS. [BOULDERS, *Suppl.*]

ERYCINIDÆ (Gr. *Erycina*, a name of

Venus), a family of beautifully-coloured lepidopterous insects.

ERYTHRI'NUS (Gr. ἐρυθρὸς ruby-coloured), a genus of fishes, of the family *Salmonidæ;* or, according to Swainson, of the *Cyprinæ*, or Carps. Their bodies are oblong, and covered with large and strong scales. The mouth is large, and the teeth formidable. They inhabit the rivers of Central Africa.

ES'KARITES (Arab. *aschraca* to shine like the sun), among the Mahomedans, a sort of Platonic philosophers, whose principal doctrine is that of placing their highest happiness and chief good in the contemplation of the great Omnipotent. They are devoted to poetry and music, and pride themselves on their morality and general placidity of temper.

ESSEX (v. 932-9). According to the census of 1851, the entire population of the county was 369,318; of which 185,399 were males, and 183,919 females. Of houses, inhabited and uninhabited, there were 77,099. The area of the county was 1657 square miles, or 1,160,549 acres, with a population of 222 persons to a square mile. The general traffic and intercommunication has been very much improved of late years by the various railways diverging from the metropolis to the north and east of the county, and thus visiting Chelmsford, Colchester, Epping Forest, Tilbury, Southend, &c. The population of the principal parishes and towns is as follows:—

Barking	4,930	Maldon par.	5,888
Booking	3,846	——— mun.	4,558
Braintree	2,836	Prittlewell	2,462
Brentwood	2,205	Romford	3,791
Chelmsford	6,033	Saffron Walden	5,911
Coggeshall	3,580	SibleHedingham	2,346
Colchester	19,443	Springfield	2,582
Dagenham	2,494	Stratford	10,586
Dunmow	3,235	Thaxtead	2,556
Epping	2,255	Waltham	2,335
Finchingfield	2,594	Waltham Abbey	2,329
Halstead	5,658	Walthamstow	4,959
Harlow	2,322	Wanstead	2,207
Harwich	4,451	West Ham	18,817
Hornchurch	2,378	Witham	3,303
Ilford	3,745	Woodford	2,774
Leyton-cum-Leytonstone	3,091	Writtle	2,423

ES'SONITE, the Cinnamon stone, a mineral which occurs in granular masses, with quartz and table spar. It is found in the United States and Ceylon. Its specific gravity is 3·631; and its constituent parts, silica, 39·83; lime, 36·57; alumina, 20·14; protoxide of iron, 9·46.

ETESIAN Winds (Gr. ἐτήσιαι annual), those periodical winds which were early noticed by the ancients as blowing from the north-east in the heat of summer, for about six weeks, throughout the Mediterranean, and especially in the Adriatic and the adjacent countries. They were mentioned by Pliny and Seneca; and Cicero says that in Italy they were salutary to animals, and beneficial to vegetation, on account of their tending to moderate the violent heat of midsummer. In the Levant they commence towards the middle of July, and are known amongst the fishermen by the name of *Meltem*, a corruption probably from *mal temps*, because of the danger to which the small fishing craft is exposed during their fury. Their cause may be assigned to the powerful heating of the earth under the tropic of Cancer during the dog-days, and the rarefied state of the atmosphere south of the Mediterranean, which doubtless gives birth to the north-east Etesian gales, which rush along with great fury.

ETH'EROLE (Gr. αἰθὴρ ether, and ἔλαιον oil), a colourless oily liquid, or oil of wine, soluble in alcohol, but not in water, which, when left for a long time at a low temperature, deposits long translucent crystals of etherine.

ETMOP'TERUS (Gr. ἑτοῖμος prompt, and πτέρυξ a fin), a genus of fishes of the Shark kind, and of the family *Squalidæ*.

ETTY, WILLIAM, the great historical painter and royal academician, was born at York, of humble parentage, in 1787. At the early age of eleven and a half he was apprenticed to a newspaper printer in Hull; but his innate love of the fine arts increased with his years; and after having worked as a journeyman printer for a few weeks, he proceeded to London, in 1805, and was so fortunate as to meet with a kind friend in his uncle Wm. Etty; and his elder brother supplied his temporary wants. His first academy was a plaster shop, kept by Gianelli, near Smithfield; and there he devoted himself to his favourite pursuit. His first production was 'Cupid and Psyche,' which received the approbation of Mr. Opie; and was the means of introducing him to that powerful genius, Fuseli, who admitted him as a probationer in Somerset House. He afterwards obtained an introduction to Sir Thomas Lawrence, under whom he remained as a pupil for twelve months. He now continued to pursue his studies with the closest intensity; and on the death of his uncle, who bequeathed him a considerable sum, he was enabled to proceed on a tour to Italy, where he imbibed that taste for Venetian art, which he subsequently carried to such high perfection in his numerous works. His 'History of Judith,' his 'Joan of Arc,' and 'Judgment of Paris,' may justly rank among the best compositions of the modern school of art. He died in 1850.

EUCHLO'RINE (Gr. εὖ well, and χλωρὸς green), the protoxide of chlorine, a compound which was first discovered by Sir H. Davy. This distinguished chemist ascertained that if hyperoxymuriate of potash be distilled by a gentle heat in a glass retort with diluted muriatic acid, a gas will escape consisting of chlorine and oxygen; although it is known that these two bodies do not unite by simple mixture. To this compound he gave the name of Euchlorine. If this gaseous compound be received over mercury, it will be found to possess a brighter colour than chlorine, and more inclining to yellow. A few years after the above discovery, Sir H. Davy announced another new compound of Chlorine and oxygen, containing more oxygen than Euchlorine, and of a much more brilliant colour than that gas. (*Philosophical Transactions of* 1815.)

EUDI'ALITE (Gr. εὖ well, and διαλύω to

break), a mineral of a vitreous brownish-red lustre, which occurs both massive and crystallized. The primary form is a rhomboid; and the massive varieties are amorphous and imbedded. Its specific gravity is 2·9; and its component parts, silica, 52·47; soda, 13·92; zirconia, 10·89; lime, 10·14; oxide of iron, 5·85; oxide of manganese, 2·57; water, 1·80; muriatic acid, 1·03.

EUDOX'IANS, a sect of Arians founded in the fourth century by Eudoxius, patriarch of Antioch.

EUMOL'PIDÆ, among the Greeks, the name of an important order of priesthood, whose duty it was to superintend the Eleusinian festivals. The name was derived from Eumolpus, King of Thrace, who was appointed priest of Ceres by Erectheus, King of Athens; and the sacred office remained in his family for 1200 years.

EUNI'CIDÆ, a family of the wandering Annelides, the feet of which are furnished with long filaments springing from one stem.

EUPATO'RIA, a sea-port town situated on the western side of the Crimea, 38 miles W.N.W. of Sinferopol, and 34 miles from Sebastopol. It was formerly known as Koslov, when subject to Turkey; but now it belongs to the Russian Government of the Taurida. It has a large harbour, a custom-house, hospital, and Tartar school; and a considerable trade is carried on. Population about 7000. During the late war with Russia it acquired some celebrity, as being the place near which the allied troops of England and France effected a landing, and which afterwards became their great military depot.

EUPAT'RIDÆ, a term applied to the nobility of Athens, as distinguished from the *Geomori* and *Demiurgi*. They had extensive municipal powers; as the choosing of magistrates, interpreting religious mysteries, and dispensing the laws. Their first establishment was attributed to Theseus. The Geomori were husbandmen, and the Demiurgi artificers; both of which were greatly inferior to the Eupatridæ.

EURITE (Fr.), a variety of granite, occurring in the granite beds of Cornwall. It is the Whitestone, or Weiss-stein of Werner; and when in its most compact form it becomes a porphyry.

EUROPE (v. 1003-13). Since 1848, when the revolution in France drove Louis-Philippe from the throne, many political convulsions have agitated Europe, which are noticed under the respective countries where they occurred; but no territorial changes of any importance took place. But to the military and naval strength of the principal States considerable accessions have been made, which are enumerated with tolerable accuracy in a work recently published (1858) by Mr. L. Wraxall. Thus he represents the total strength of the native English army at 147,089 men, with 120 horsed guns; the East Indian army at 820,000 men; and the militia at 120,000. The navy of Great Britain he computes at 545 ships in commission, or partly equipped (including 94 ships of the line), 150 vessels of a smaller description; and an equal number of large steamers belonging to private companies, which might be rendered available for public service, in case of war. Russia is stated to have an active army of 687,000 men, with a reserve of 258,000 men, besides garrison troops, irregulars, and military colonists. Her naval strength, before the late war, consisted of 186 ships, and 350 gunboats. The military force of France is computed at 566,000 men, with an organized reserve of 180,000; and 100,000 national guards. Her navy consists of 328 vessels, including 53 sail of the line, all of which would require 96,000 sailors to man them. Before the late war Turkey had a military force of 474,860 men, regular and irregular, with 70 ships of war, and 40,000 seamen. The strength of Sardinia is computed at 47,000 soldiers, and 29 ships; Austria at 450,000 troops for the field, and 200,000 garrison reserves. Prussia at 580,000, of which two-thirds might be employed beyond the frontier; the German Confederation at 180,000. The military forces of Norway and Sweden are represented by an army of 167,400 men; those of Denmark by 22,900 on active service; those of Belgium, including reserves, by 100,000; and those of Holland by 51,000. The several navies, from Austria to Holland, may be manned by about 20,000 sailors. So, that the European powers employ, for naval and military purposes, an aggregate of not much less than 5,000,000 of men.

The following is a summary of the present reigning Sovereigns of Europe (1858), with the populations of their respective countries, according to the most recent returns.

		Born.	Began to Reign.	Population.
Austria, &c.	Emp. Francis Joseph	1830	1848	36,950,401
Bavaria	Maximilian Joseph	1811	1848	4,440,327
Belgium	Leopold I.	1790	1831	4,258,326
Denmark	Frederick VIII.	1808	1848	2,194,930
France	Emp. Napoleon III.	1808	1852	35,138,726
Great Britain	Queen Victoria	1819	1837	27,675,257
Greece	Otho I.	1815	1833	637,700
Hanover	George Frederick	1819	1851	1,773,711
Naples and Sicily	Ferdinand II.	1810	1830	8,023,300
Netherlands	William III.	1817	1849	3,237,359
Portugal	Pedro V.	1837	1853	3,412,500
Prussia	Frederick Wm. IV.	1795	1840	15,447,440
Popedom (Rome)	Pius IX.	1795	1846	2,698,115
Russia	Emp. Alexander	1811	1855	65,901,800
Sardinia	Victor Emanuel	1820	1849	4,879,000
Saxony	Frederic	1797	1836	1,757,800
Spain	Queen Maria Isabella	1830	1833	12,286,941
Sweden & Norway	Oscar	1799	1844	4,306,605
Turkey	Gr. Sig. Abdul Medjid	1823	1839	10,000,000

EURYLAM'INÆ (Gr. εὐρὺς wide, and λαιμὸς the throat), a sub-family of the *Muscicapidæ*, or Fly-catchers, with a powerful structure, and a short and excessively broad bill, short wings, and strong feet.

EUSTATHIANS, a Christian sect of the fourth century, who refused to acknowledge any other bishop but St. Eustathius, who had been deposed by the Arians.

EXCELMANS, MARSHAL, one of Napoleon Bonaparte's most illustrious generals, was born at Bar-le-duc, in 1775. He first distinguished himself in the 3rd battalion of the Meuse, under General Oudinot, in 1799; and at the opening of the campaign of Austerlitz, when a captain of dragoons, he displayed extraordinary bravery,

with a very small force, against a large body of Austrians at Wertingen, for which he was promoted by the emperor to the Legion of Honour. On the field of Enau he fought his way to the rank of general of brigade. Shortly afterwards he was sent with Murat to Spain, and conveyed the royal family, surrounded by great difficulties, out of their dominions. He was subsequently taken prisoner, and detained in England for three years; but was exchanged in 1811, and served in the campaign of Russia. After the battle of Moscow, in 1812, he was promoted, for his bravery, to the rank of lieutenant-general. In the campaign of 1814, he was placed at the head of the imperial guard; and commanded the second division of cavalry at the battle of Waterloo. After the loss of that battle he appears to have been the only officer in command of the scattered legions of France, who persevered in his duty to the emperor; and the last military feat of his chequered life was in the brilliant skirmish with the Prussians at Versailles. On the restoration of the Bourbons, he was banished from France, and resided for some time in the Grand Duchy of Nassau. Being permitted to return to his native country, after the accession of Louis-Philippe, he was raised by that sovereign to the dignity of a peer of France; but it was reserved for the present Emperor of the French to confer the staff of a Marshal of France on this venerable survivor of the imperial armies; and in 1849 he was appointed Chancellor of the Legion of Honour. At the crisis of the *coup-d'état*, in December, 1851, the marshal was actively engaged in securing the services of the army in support of the new Government.

Among all the distinguished men who followed the fortunes of the first Napoleon, Excelmans may be considered as one of the most faithful, most unostentatious, and most disinterested. His death took place suddenly, in July 1852, in the 77*th* year of his age.

EXCHEQUER BILLS (vi. 15) are money notes issued by the Government, and paid to the Bank of England for pecuniary advances. They bear an interest (according to the state of the money market) of from 1½*d.* to 3*d.* per day for 100*l.* The security for their repayment is the actual taxation of the country receivable by the Treasury of England. The Bank (by way of supplying the immediate exigencies of the Government) gives its own notes, which chiefly maintain their value from the security of these bills. Thus if Government has to borrow ten millions of money as a mere temporary accommodation, the cost for a year's interest will exceed a quarter of a million of money, which is extracted from the pockets of the public. The entire interest which has thus been swallowed up by the Exchequer-bill system, since its first establishment in 1696, is really astounding, and perhaps the time will soon arrive, when it will become a public question, not as to the rate of interest, but as to the expediency of issuing Exchequer-bills at all? or why the public should be called upon to pay interest upon the paper money advances of a private corporation, when the Government itself could issue notes in its own name, without interest, which would be at least as valid a security as those of a private company, and save an enormous annual cost, in the shape of interest. What, indeed, is to prevent the Government issuing its own paper, under the name of *Exchequer Notes*, with the national treasury for their security, and thus saving the interest which is annually charged to the general taxation of the country? If these notes were of the same value as those of the Bank of England (say from 10*l.* to 100*l.*), and their repayment guaranteed by the treasury of the empire, they would be gladly received by the manufacturer, the tradesman, and general dealer; for every one must admit that a Government, which is in the receipt of thirteen or fourteen millions quarterly, is better enabled to give validity to its notes than any private corporation, which may be subject to all the contingencies of trade and commerce. Besides, there would be another advantage, arising from the increased confidence which would be reposed by foreigners in a currency secured by the Government, and guaranteed by the national property. In all the leading cities of Europe, where the credit of England is known, these Government notes would generally maintain their full value.

EXCU'BIÆ, among the Romans, the guards or watches kept in the day by the military; and contradistinguished from the night-watches, which were termed *Vigiliæ*.

EXEGE'TES, the name of those learned Athenian lawyers, whom the judges were in the habit of consulting in cases of difficulty, and especially in those of a capital nature.

EXHIBITIONES, in the Middle age, were certain allowances made by the religious appropriators of churches, for the use of the depending vicar. The term was eventually applied to those benefactions settled for the maintenance of scholars in the universities, and not dependent on the foundation. In modern times they are called *Exhibitions*.

EXO'DIUM, among the Romans, a kind of farce performed on the termination of the tragedy, for the diversion of the audience. It consisted of a recitation of facetious verses; and the reciter was a sort of buffoon, called the *Exodarius*. In Greek tragedy the term was applied to the denouement of the plot.

EXPANSION, LAWS OF. [Bodies—Natural, Cold and Ice, *Suppl.*]

EXPIATION, among the Jews, a solemn act of atonement for sin; of which there were several kinds; as, for sins of ignorance committed contrary to law; purifying themselves from certain legal pollutions, &c. The most solemn day of expiation for the whole nation was called *Kippur*. It was celebrated on the 10th of the month Tizri, or September. Among the ancient Greeks and Romans there were also solemn days of expiation for averting public calamities, threats of prodigies, &c.

EXPORTS AND IMPORTS, are the commercial exchange of the surplus productions of one country for those of another; the amounts of which may be considered as the barometer of national prosperity. When the exports of any

country exceed the imports, the balance of trade is said to be in its favour; but when the imports, as valued in money, exceed the exports, the balance is considered as unfavourable, because, in that case, it is obliged to pay the difference in cash, and thus part with its precious metals, from which, if the drain continue any length of time, a disarrangement of the currency or a money panic may ensue. But in this country we find that the exports have usually exceeded the imports; and that their amount has been progressive for a long series of years. These exports have consisted chiefly of cotton, woollen, and linen cloths; manufactured iron, copper, brass, and tin implements, cutlery, hardware, and innumerable products of the loom and the anvil, besides the surplus produce of our colonies. The imports, in exchange, principally consist of the agricultural productions of foreign countries; as corn, fruit, tea, coffee, sugar, raw cotton, and wool, wines and spirits, timber, hemp, flax, tallow, oil, ivory, gum, drugs, silk, indigo, cocoa, metals, &c.

On taking a review of this important subject, for the last ten years, we find that in 1849 the exports amounted to 63,500,000*l.*; in 1850, to 71,300,000*l.*; in 1851, to 74,400,000*l.*; in 1852, to 78,000,000*l.*; in 1853, to 98,800,000*l.*; in 1854, to 97,000,000*l.*; and in 1855, to 95,688,085*l.*; of which 69,135,210*l.* represented the exports to foreign countries, and 26,552,875*l.* to British possessions. During the same periods there has been a nearly corresponding increase of imported commodities, in exchange for those exports, which have extensively contributed to the national wealth, and the increased comforts of the community at large. Thus the articles of food, imported in 1855, amounted to 3,691,174*l.*; while, in 1856, they increased to 5,899,491*l.* The imports of sugar, in July 1855, were 798,497 cwt., and in 1856, 1,143,577 cwt. The teas imported in 1855, were 4,045,246 lbs., while in the first half year of 1856, the imports were 7,872,505 lbs. The imports of rice were, in 1855, 240,218 cwt.; and in 1856, 524,800 cwt. There was also a large increase in the importation of wines and spirits. In 1856, the import duty on foreign butter realized 123,870*l.*; on cheese, 49,174*l.*; on corn and flour, 463,811*l.* According to a parliamentary return issued at the end of 1857, it appears that the quantity of corn imported into this country during the ten months of that year, ending October 31, amounted to 2,532,129 quarters against 3,178,327 quarters imported the previous year. When compared with the preceding year, there have been some changes in the localities from whence the supplies usually come. Thus, in 1857, there was a decrease in the supply from Turkey and Egypt, and the Danubian provinces, and a small increase from Denmark and the Baltic. The quantity from Prussia was more by 571,250 quarters, and Russia sent less by 161,324 quarters. From America there was a falling off, from 841,426 quarters in 1856, to 426,664 quarters in 1857. The importations of barley, during the ten months of 1857, were 1,493,350 quarters against 468,045 quarters of the previous year; this great increase

arising from the failure of the crop in this country. Of oats, there were imported, in 1856, 910,247 quarters; which, in 1857, had increased to 1,459,575. The importation of peas was 138,471 quarters, which was more than double that of 1856; while in beans the diminution of supply amounted to 77,011 quarters. In 1856, the amount of Indian corn imported was 1,561,843 quarters; and in 1857 it had decreased to 861,583 quarters. The quantity of wheat-meal and flour imported in 1857 was 1,435,198 cwt. against 3,395,930 cwt. in 1856, or a decrease of 1,960,732 cwt. America sent, in 1856, 2,419,569 cwt., while the figures in 1857 were only 992,168 cwt. Spain also, which country in 1856 contributed 466,008 cwt., dwindled down, in 1857, to 15,982 cwt.

The exports and imports of metals, in their raw or manufactured state, form a most important branch of our commercial and manufacturing industry. During the year 1857, there were exported from the United Kingdom, of British copper, 7146 tons unwrought and in pigs and bricks; 13,726 tons 15 cwt. in nails, sheets, and mixed metals; 3103 tons 1 cwt. wrought of other sorts; 154 tons 4 cwt. of copper coin; and 13 tons 13 cwt. in wire; making a total of 24,143 tons 13 cwt. of British copper exported. Of foreign copper 1392 tons 1 cwt. were exported from England in the form of pigs and unwrought; 4 tons 10 cwt., old; 762 tons 4 cwt., partly wrought; 34 tons 1 cwt. in plates and coin, and 1 ton 9 cwt. in other manufactures and engraved plates, making the total British and foreign exportation from England, during the year, 26,989 tons. During the same period, there were imported into the United Kingdom 75,332 tons of copper ore; 19,262 tons of partly-reduced copper called regulus; 2571 tons of rough unwrought, and cast copper; 1033 tons of old copper only fit for re-manufacture; 3864 tons of hammered copper and bars, rods, and ingots; 81 tons of copper plates and coin; and 975 cwt. of copper manufactures and copper-plates engraved. Taking these together, and allowing for the yield of the ores, the total importation would be equal to about 30,000 tons of metal. The export of British tin, from England in 1857, was 2187 tons 18 cwt., and of foreign tin 330 tons. The importation of tin during the year was 2708 tons in metal, and 1387 tons in ore, about half of which was from our Indian possessions. In 1857, there were exported from England 3123 tons 10 cwt. of British zinc, and 137 tons 18 cwt. of foreign zinc. The total quantity of zinc, imported from foreign countries into the United Kingdom during the same year, was 18,001 tons, of which upwards of 10,000 tons came from the Hanseatic towns, and nearly the whole of the remainder from Prussia and Belgium. There were exported from Great Britain, and during the same period, 19,272 tons of British and 240 tons of foreign lead in pigs and sheet, 2816 tons of British lead in shot, 2875 tons of British and 2 tons of foreign red lead, 2375 tons of British and 4 tons 7 cwt. of foreign white lead; and 662 tons of British litharge, and 538 tons of British lead ore, being equal, in the total exporta-

tion, to about 26,000 tons of British lead. Of the same material there were imported into Great Britain 12,768 tons of lead and 953 tons of lead ore, nearly the whole of which was from Spain. There were also imported 74 tons of white lead and 11 tons of chromate of lead.

Within the last twenty years, our exports to the United States and British colonies, especially to the latter, have been wonderfully on the increase. In 1836 our exports to the former only amounted to 12,425,625*l.*, while in 1857 they realized 19,182,931*l.* In 1836 our commerce with America formed nearly one-fourth of our entire export trade, while in 1857 (such has been the general increase) it did not constitute more than one-eighth of our export trade. While our commerce with the United States has augmented little more than 50 per cent. in twenty years, our general trade with the East and West Indies, Australia, and the rest of our colonies, has increased nearly 150 per cent. during the same period. In 1856 the aggregate value of our exports to the British colonies was only 15,259,705*l.*; and in 1857 they had increased to 37,115,247*l.* The following summary will show the distribution and comparative increase or decrease of exports to our different colonial possessions:—

	1836.	1857.
East Indies	£4,285,829	£11,648,341
Australia	835,637	11,626,146
British America	2,732,291	4,325,645
West Indies	3,786,453	1,834,251
Cape and Natal	482,315	1,863,113
Singapore	———	898,240
Hongkong	———	720,771
Mauritius	16,358	664,211
Gibraltar	756,411	655,120
Channel Islands	318,609	537,440
Ceylon	———	513,588
Malta	143,105	446,369
Western Africa	467,186	372,882
Ionian Islands	109,123	253,321
Honduras	———	156,481
Other possessions	———	83,782

The total of the exports and imports of Great Britain, for 1857, amounted to the extraordinary sum of 288,545,680*l.*; with the balance of trade considerably in our favour.

F.

FABER, REV. G. S., Master of Sherburn Hospital, near Durham, and a voluminous writer on Prophecy, was born in 1773; and educated at the Grammar School of Heppenholme, near Halifax. He graduated at Oxford, and as Bampton Lecturer, in 1801, preached those celebrated discourses which were shortly afterwards published under the title of 'Horæ Mosaicæ, or a View of the Mosaical Records, with Respect to their Coincidence with profane Antiquity, and their Connexion with Christianity.' His numerous theological writings, in support of the doctrines of the Reformation and evangelical truth, at length attracted the notice and conciliated the friendship of many able scholars (Bp. Burgess, Bp. Van Mildert, and others); and in 1805 he was collated by his friend and patron, Bp. Barrington, to the vicarage of Stockton-upon-Tees. After this, his promotion in the church was rapid. In 1811 he was collated to the vicarage of Longnewton, where he remained twenty-one years; and in 1831 he was rewarded with a prebend in Salisbury cathedral. In 1832 Bp. Van Mildert presented him with the mastership of Sherburn Hospital, the duties of which he fulfilled, with the greatest credit, to the day of his death.

A bare enumeration of the different theological works issued by Mr. Faber, during a period of more than forty years, would occupy several pages. The following brief list, however, will convey some just idea of the nature and character of his writings.

A Dissertation on the Mysteries of the Cabyri, or the great Gods of Phœnicia, Samothrace, Egypt, Troas, Greece, and Italy.

A Dissertation on the Prophecies that have been fulfilled, are now fulfilling, or will be hereafter fulfilled, relative to the great period of 1260 years; 1806.

A general and connected View of the Prophecies relating to the conversion, restoration, union, and future glory of Judah and Israel; 1808.

A Dissertation on the Prophecy in Daniel, generally denominated the Seventy Weeks; 1811.

The Origin of Pagan Idolatry; 1816.

The Difficulties of Infidelity, 1824; and of Romanism, 1826.

The Sacred Calendar of Prophecy; 1828.

The Difficulties of Romanism in respect to evidence; 1830.

The Apostolicity of Trinitarianism; 1832.

The Primitive Doctrine of Justification, 1837; and of Regeneration, 1840.

Letters on Tractarian Secession to Popery; 1846.

On Papal Infallibility; 1851.

The Revival of the French Emperorship anticipated from the necessity of Prophecy; 1853.

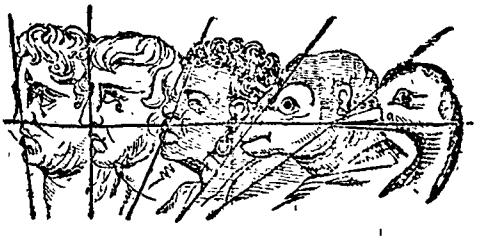
The predicted Downfall of the Turkish Power the preparation for the return of the Twelve Tribes; 1853.

These two last productions were, for the most part, chiefly reprints of the writer's deductions from the prophetical records published many years before. He died in 1854.

FACE, in military matters, a term of varied application, especially as applied to the different parts of a fortress. The *extended face*, for instance, is that part of the line of defence extending from the curtain to the angle of the shoulder. The face of the bastion is the line which extends from the flanks to the salient angle. The *faces of a square* are the different sides of a body of men when formed into a square, as the *front*, the *rear*, the *right*, and the *left* face. The *face of a* gun is the superficies of the metal near the muzzle of a piece of ordnance. (*Mil. Encyc.*)

FACET (Fr. *facette*), among lapidaries and jewellers, the name of the little faces or planes, which are ground in diamonds and other brilliants. It is by means of the facets that the glittering brilliancy of the diamond is produced at every change of the face or angle of the facets. [DIAMONDS, *Supplt.*] In mineralogy the minute faces of crystals are called facets; and in zoology the compound eyes of insects are termed facet-eyes, each eylet being a facet.

FACIAL ANGLE, in physiology, an angle of the *face*, consisting of two imaginary lines; the one perpendicular, or nearly so, and the other horizontal. The former one touches the most prominent part of the forehead; while the latter passes over the meatus auditorius, or opening of the ear, and terminates at the extremity of the alveolar process of the upper jaw. It was the invention of Camper, a celebrated Dutch physician and naturalist, who, during the middle of the last century, wrote an ingenious treatise on 'The Physiognomy of Men of different Nations' [CAMPER], and conceived the idea, which the phrenologists now entertain, that the degree of intellect was according to the angle formed by these two lines. Thus the ancient Greeks appear to have had the largest frontal development, and the Carib Indians the least. In the same manner, when we descend to the inferior animals of creation, we find the cerebral angle depressed according to the degree of stupidity by which the animal is distinguished. Thus the annexed outline of the Greek, the Roman, the Negro, the Monkey, and the Goose, will illustrate the facial angles of each; and exhibit the different gradations of cerebral depression from the highest to the lowest degrees of intellect.



THE FACIAL ANGLES.

According to this scale, we shall find that the usual angle of the mythological gods and heroes of the Greeks exceeded the perpendicular line of 90°; which shows the opinion the Greek artists entertained of that peculiar development being indicative of high intellect. The usual angle of Europeans is from 80° to 90°; that of the Negro from 70° to 80°; and of the monkey and goose considerably lower. In all antique busts we find that the ancient Greeks are usually represented with very prominent foreheads, at about an angle of 90°; and their gods frequently as high as 100°; but the facial angle of the Romans and their western successors is represented at about 85°.

In physiology, the term *facial* is variously applied; as, for instance, the bones of the face (thirteen in number), exclusive of the teeth, are called the *facial bones*. The three principal divisions of face are termed the *facial muscles*, and the nerve with which those muscles are supplied, and which rises from the lower and lateral parts of the pons varolii, is termed the *facial nerve*. The vein which passes obliquely across the face, and terminates in the internal jugular, is called the *facial vein*.

FACINGS, the term applied, in military matters, to the trimmings or figure work of regimental uniforms, which are usually of a different colour from the body of the coat, and appear on the collars, cuffs, lappets, or fronts. They are of all colours; but dark blue is confined to the royal regiments, the fusileers, royal marines, and the staff of the army. The facings of the artillery are scarlet. The term *facings* is also applied to the different movements of soldiers to the right, left, rear, or front. (*Mil. Encyc.*)

FACTORIES (vi. 65). The provisions for the regulation of factories, passed in 1846 and 1847, have already been noticed. In 1856 another Act was passed, the principal provision of which was to enforce the fencing of mill-gearing and machinery. But, according to the reports of the factory inspectors, the provisions of the arbitration clause contained in that Act were wholly inadequate to afford that amount of protection to the operations which had been contemplated by the legislature, and therefore the inspectors had not ventured to act upon it. This report contained some useful statistics connected with the general condition of our factories. It appeared that the number of factories, from which schedules were received in 1856, amounted to 5117 against 4600 in 1850, and 4217 in 1838. Of these, 2210 were cotton factories, 1505 woollen, 525 worsted, 417 flax, and 460 silk. The increase in the cotton factories

was 1·42 per cent., while it was 6·6 per cent. in the silk ones. The woollen and worsted trades were becoming concentrated in Yorkshire; while the flax trade was most prosperous in the north of Ireland. Power-looms had increased from 115,801 (in 1836) to 369,205; and the number of spindles was returned at 33,503,580. The total number of children employed in all kinds of factories amounted to 46,071; the number of males between thirteen and eighteen, 72,120; the number of females above thirteen to 387,826; and the number of males above eighteen years, to 176,400; making a total of 682,497. The average value of the cotton goods and yarn exported in the three years of 1853, 1854, and 1855, was, in round numbers, 31,000,000*l.* Of woollen and worsted goods and yarn the average exports, for the three years, amounted to 10,000,000*l.*

FALERNIAN, a species of wine frequently mentioned by the Roman poets:—

'Et amicus Aulon
Fertili Baccho minimùm Falernis
Invidet uvis.' HOR.

It was so called from Falernum, a mountain of Campania, where it was produced, and was considered one of the best wines in Italy. There were three kinds mentioned by Roman writers, the sweet, the fine, and the rough; and that called Faustianum was the best.

FALO'PIAN TUBES, in anatomy, two ducts springing from the womb, and extending, one on each side the fundus, to the ovaria.

FALUNS, in geology, a term applied to certain deposits, consisting chiefly of quartz, broken shells, gravel and sand, which are found in the middle tertiary formation. They contain organic remains of the mastodon, rhinoceros, palæotherium, hippopotamus, the tapir, the horse, and various mammalia, besides a great number of extinct and recent shells. Their thickness is computed at about sixty feet.

FANE, GENERAL SIR HENRY, commander-in-chief in India, commenced his military career, in 1792, as a cornet in the 6th Dragoons. After passing with credit through the different military grades, he was appointed, in 1808, brigadier-general, and directed to take the command of the advanced guard of the army in Portugal under Sir. A. Wellesley. He headed these troops at the affair of Roleia, and at the battle of Vimiera. He was also at the battle of Corunna, under Sir John Moore; and in 1810 he received the rank of major-general. In the spring of 1811 he was appointed to command the cavalry under General Hill; and remained with them till the termination of the war, having been engaged in the battles of Busaco, Vittoria, Orthes, and Toulouse. On account of his important services in the Peninsula he was appointed colonel of the 4th Dragoon Guards, and made a knight-commander of the Bath. In 1835 he received the important appointment of commander-in-chief in India. On the return of a large portion of the British forces from Cabul he resigned his command, and took his departure for England; but he died on his voyage home in 1839.

FANS (vi. 97). Ladies' fans are made of various materials, as coloured paper, satin, vellum, parchment, gauze, feathers, carved bone or ivory, &c.; and China and France are the principal seats of their manufacture. The Chinese are celebrated for their elegantly-carved ivory fans; and their value is increased, according to the decoration of the leaf or surface of the fan. Formerly the Chinese fans commanded the markets of the world; but of late years the French, by the aid of ingenious machinery, and the division of labour, have been enabled materially to increase their exports, and most effectually compete with the Chinese. At this time the manufacture of fans is carried on in France to an almost incredible extent; and it is wonderful to contemplate the ingenuity and taste which are devoted to their production and ornamentation. There are many distinct branches of trade carried on by different capitalists; and in the production of a fan, which sells for a half-penny, there are about twenty different operations, performed by as many pairs of hands. In the department of the Oise, there are about 2000 men, women, and children, employed in the frame-work of fans, the wood of which chiefly consists of sandal-wood, ebony, lime, and plum; but the printing, colouring, mounting, piercings, and general decorations, are mostly completed at Paris. According to the 'Statisque sur l'Industrie à Paris,' drawn up by MM. Roudot and Say, for the Jury Report of the Exhibition of 1851, it appears that 'in 1847 there were 122 fan-makers, comprising chamber-masters, mounters, feuillistes, painters, and colourers. The value of the fans made was 100,000*l.* These masters employed 575 work-people (262 men, 264 women, twenty-nine youths, and twenty girls). The workmen on the average earn 3*s.*, and the women 1*s.* 8*d.* per day. The men were for the most part copper-plate engravers and printers, painters and colourers, and overlookers. In twenty years it appears that the produce in fans had increased in value nearly threefold; whilst the number of work-people had diminished one-half. This change is attributed to the employment of machinery, especially of the fly-press, in stamping out and embossing the ribs, and the extensive employment of chromo-lithography, an art not practised at the former period.'

The Fan-makers' Company is one of the minor companies of London, which has no hall.

FANTASIA (Ital.), a species of musical composition, struck off from the impulse of the moment, and limited to certain extemporaneous flights of fancy, where the composer is allowed to give free range to his imagination and feelings, and even to disregard those rules and restrictions by which other musical compositions are regulated.

FARMS AND FARMING. Statistical returns of the various 'holdings,' made by British farmers, have been recently made; from which it appears that in the area of these kingdoms there are 78,000,000 of acres, at a rental of 127,000,000*l.* per annum; 14,000,000 of which are improvable waste, and 12,500,000 uncultivated. The number of farms is 225,318; the average size being

111 acres, and two-thirds of the farms are under this size; but there are 771 above 1000 acres in extent; the small farms abounding in the north, and the large ones in the south-eastern and eastern counties. Two-thirds of the land of England is occupied in farming. Nearly 2,000,000 acres are held by 2000 English farmers; and there are 97,000 small English farmers not holding many more. Of labourers, there are 40,650 farmers who employ five each; 16,501 have ten or more; and 170 farmers employ above sixty each.

FASCES, among the Romans, a term applied to the axes, bound together with a bundle of rods, which the twelve lictors carried before the chief magistrates. The axe and the bundle of rods were intended to represent, first, the emblem of punishment; and secondly, the power of unanimity among the citizens. The fasces were first introduced by Tarquin, as a mark of sovereign authority, and afterwards adopted by the consuls.

FASCIA (Lat. a *bandage* or *ligament*), a term of very general use in anatomy, and applied to any aponeurotic expansion of muscular fibre by which certain parts are bound together. Among the principal fasciæ of the animal system are,—the *Iliac fascia*, which covers the inner surface of the iliac and proas muscles;—the *transverse fascia*, or cellular membrane that lines the inner surface of the transversal abdominal muscle;—the *F. lata*, a thick tendinous muscle which runs from the tendons of the glutei and adjacent muscles to surround the muscles of the thigh;—the *superficial fascia*, a very thin layer of cellular muscle that covers the abdominal muscles of the thigh. The *cerebral-formed fascia* is a small web of cellular substance, stretching from the lower edge of Poupart's ligament over the inguinal glands;—the *F. infundibuliformis* is a portion of the cellular membrane, which is funnel-shaped, and passes down the spermatic cord, where it penetrates the transversal fascia.

In classical antiquity the fascia was a thin sash, frequently mentioned by Latin writers, which the Roman ladies wrapped round their bodies, next to the skin, for the purpose of giving a slenderness to the waist. In architecture the fascia is a broad fillet or band, sometimes used alone, and sometimes in combination with the mouldings of the architrave or imposts. It sometimes happens that two or three fasciæ, according to the taste of the designer, constitute the different divisions of the architrave, each of which projects slightly beyond that which is directly below. In astronomy, the term fascia is applied to the belt across a planet, as the fasciæ or belts of the planet Jupiter.

FASCIO'LA (Lat. a *small winding band*), in entomology the Flukeworm, a genus of the Entozoa, or intestinal worms, belonging to the family *Trematodea*. In conchology, a genus of Mollusca, belonging to the family *Turbinellidæ*, and sub-family *Turbinellinæ*, in which the shell is ventricose and fusiform, and the spine and aperture of equal length. The *Fasciolaria* is the name of another genus belonging to the same family, in which the outer lip is crenated, and the base of the pillar marked with two large folds.

FASCIOLI'TES, a genus of fossil Cephalopods allied to the Mummilite.

FAS'SAITE (from *Fassa*, in the Tyrol), a dark-green mineral, a variety of augite, which is found in limestone and trap-rocks, especially in Scotland and Ireland, as well as in the Tyrol.

FA'TALISM (Lat. *fatalis*, of or belonging to destiny), the doctrine which maintains that every human being, from the cradle to the grave, is under the irresistible influence of *fate* or destiny, which deprives man of the power of free-will, and allows him no control over the actions of his life. This is the leading doctrine of the Mohammedans, the Predestinarians, the rigid Calvinists, and the Philosophical Necessarians; all of whom maintain that the successive operations of Nature are under the absolute guidance of some Almighty power, and thus take place from inevitable necessity. In the same manner the fatalists contend, that the human will, though apparently free, is regulated and controlled by the decrees of fate, or the irresistible influence of circumstances; so that whatever is, or has been, could not by any possibility be otherwise. The advocates of free-will, or free agency, are in direct opposition to these tenets, so far as they apply to the freedom of human action; and contend that fatalism and predestinarianism are dangerous doctrines, that sap the foundations of every virtuous impulse, by reducing man to a mere passive machine. Pope, in his 'Universal Prayer,' has summed up the whole argument in a few expressive words:—

> "Yet gave me, in this dark estate,
> To see the good from ill;
> And binding Nature fast in fate,
> Left free the human will."

FATUARII (Lat. *fatum* fate), among the ancient Romans, a term applied to men who pretended to the spirit of prophecy, and to the foretelling of future events.

FAULTS. [Coal Fields, and Dykes, *Suppl.*]

FEATHERS (vi. 115). The manufacture of feathers into ornaments of dress employs a vast number of industrious hands, especially females; and great skill and ingenuity are frequently exhibited in their production. The feathers most in use for military and dress purposes are those of the ostrich, the emu, the heron, the marabou-stork, the ibis, the birds of Paradise, and the osprey. The tail feathers of the domestic cock, either dyed, or in their natural colours, are much used as military plumes. Swan's down is also in use for muffs and trimmings of ladies' dresses. The soft fine down of aquatic and other birds of northern latitudes, from their softness and elasticity, are of great service in contributing to the comforts of man in a variety of ways. Feathers therefore form a very important article of commerce. Eider down is largely imported from Denmark; the ducks or aquatic birds that supply it being inhabitants of Norway, Greenland, Iceland, or Hudson's Bay. The down of the swan is brought from Dantzic. The islands west of Scotland breed numbers of aquatic fowls, which produce the eider down, and prove a source of profitable trade for the poorer inhabitants.

FEL'AGUS, among our Saxon ancestors a kind of friend or associate, in the local decennary, who was responsible for the good behaviour of another. The word is particularly noticed in the laws of king Ina, where it is said that if a murderer could not be found, the *felagus* of the person slain, in the absence of parents, should have six marks, and the king forty.

FELLOWES, DR. ROBERT, a political and theological writer of some eminence, and for many years the editor of the 'Critical Review.' He was born in Norfolk in 1770; and educated at Oxford, where he obtained the University honours of M.A. and D.C.L. He was the intimate friend of Dr. Parr, and of Baron Maseres; the former of whom had a strong regard for him; and the latter, at his death, left him nearly 200,000*l.* This enabled him to benefit his fellow-creatures in various ways, and at the same time to gratify his own liberal tastes for literature. On the first proposal for founding a London University, Dr. Fellowes entered with much spirit into the project by his purse and general counsel. On its establishment he took ten shares of a thousand pounds each, the greater portion of which he gave away. He also left money for the founding of two annual gold medals, to be conferred on the greatest proficient in clinical medicine; they are now called the Fellowes' Medals.

Dr. Fellowes was the author of many religious publications; but he gradually relinquished the doctrines of the Church of England; and, at length, adopted the opinions maintained in his 'Religion of the Universe,' published in 1836. Among his numerous publications may be mentioned his 'Picture of Christian Philosophy' (1798); 'Morality united with Policy' (1800); 'Religion without Cant' (1801); 'Guide to Immortality' (1804); 'The Essentials of a Christian Church;' and 'The Rights of Property vindicated against the Claims of Universal Suffrage.' He died in 1847.

FENCIBLES, regiments temporarily raised for the purpose of defending the country in case of invasion. The officers rank with the militia of the same grade.

FERA'LIA, certain festivals among the ancient Romans, held in honour of the dead. They were of eleven days' continuance, during which marriages were forbidden, and the temples closed.

FERENTA'RII, light-armed auxiliary troops among the ancient Romans, whose weapons consisted of a sword, sling, and arrows.

FERGUSON, JOHN, an eminent and wealthy merchant, of Irvine, in Ayrshire, whose name is extensively associated with nearly all the charitable institutions of the counties of Ayr, Kirkcudbright, Wigtown, Lanark, Renfrew, and Dumbarton. He was born in 1788, and derived the greater part of his immense fortune from his maternal uncles; which, by thriftiness of living, and judicious investment, was largely increased at the time of his death. At the opening of his will it was found that he had died possessed of property to the value of 1,250,000*l.* Besides leaving numerous legacies to relations and friends, amounting in all to 701,000*l.*, his bequests to the various charitable, educational, and religious institutions, were of the most munificent character. To the different charities of Irvine, where he resided, he left 13,300*l.*; to the charitable, educational, and benevolent societies and institutions of Scotland, 50,000*l.*; to religious societies in Scotland, 20,000*l.*; to the ragged schools in Scotland, 10,000*l.* The reversion of the estate, which is very large, was directed to be set apart, and invested in real or personal securities as a permanent fund, to be called 'The Ferguson Bequest Fund,' for the maintenance and promotion of religious ordinances and missionary operations, for education and public libraries in the six western counties just enumerated; and for the erection of churches and schools in connection with the Establishment, the Free Church, the Reformed Presbyterian Church, and the Independent Church. He died at his residence, near Irvine, in 1856.

FERIÆ (Lat. *fairs*), certain holidays among the Romans, which were first established by Servius Tullius, and eventually transmitted, under different forms, to the various nations of Europe. At these festivals no work was permitted to be done. The laws were promulgated; decrees made known; public declamations delivered; tents, booths, and shows erected; and various amusements practised. They were of various kinds, as the *Feriæ Stativæ*, which were kept by the whole city on certain days named in the calendar; *Feriæ Conceptivæ*, fixed by the priests or magistrates;—and *Feriæ Imperativæ*, which were simply ordered by the consuls or other chief officers of state, for the purpose of commemorating some important event. In the Middle age, these Feriæ, or Fairs, continued to be observed, but under different modifications, and for rather different objects. They usually originated from the religious observances that took place at the dedication of any new church; when, on the subsequent anniversaries of this event the neighbouring farmers and tradesmen were in the habit of assembling for the purpose of disposing of their commodities or wares, and, after transacting the necessary business, of indulging in rustic revelry, dancing, or other general amusement. [FAIRS.]

FERMANAGH, County of (vi. 143–5). According to the census of 1851, the population was 115,978; and inhabited houses, 20,264. Enniskillen is the principal place of the county, and its population is 5773.

FEROZESHAH, a village of Hindostan, in the province of Lahore, famous for the signal defeat, in 1845, of a numerous body of Sikhs, by the British forces under Lord Gough; when 73 guns were captured, and the advance of the Sikhs into India effectually arrested.

FERRID-CYANOGEN, a compound of ferrocyanide and chlorine, the radical of which contains twice as much cyanogen and iron as exists in ferro-cyanogen.

FETICHISM, among the Negroes of Western Africa, the worship of idols, or of any material object which whim or fancy may temporarily select. This may be considered as the lowest and most degrading kind of superstition to be found in the human family. The Negroes' fetich

consists of mere stones, plants, vessels, weapons, or shells. Tribes, families, and individuals have their peculiar fetiches, which are generally selected under the influence of some superstitious notion, with which reason has no concern.

FIAT (Lat. *fio*, to cause a thing to be done), in law, a decree or warrant signed by a judge for allowing certain processes. A *fiat in bankruptcy* is a command granted by the Lord Chancellor, and directed to the court of bankruptcy, authorising a petitioning creditor to prosecute his complaint against the bankrupt in that court. It is on the strength of this order that the court is authorised to hear the petitioning creditor's complaint, and allow him to prosecute his claim. (*Archib. Bank.*)

FIB'ROLITE (Lat. *fibra* a fibre, and Gr. λίθος a stone), a mineral found in the granite of the Carnatic, of a grayish colour and fibrous texture. It is rather harder than quartz, and seldom crystallized. Its principal component parts are 58 of alumina, and 38 of silica, with some traces of iron.

FIC'ULA (Lat. *ficulus* a little fig), a genus of Mollusca, of the sub-family *Pyrulinæ*, in which the shell is pyriform, and the upper part ventricose.

FIELDING, COPLEY VANDYKE, President of the Old Society of Painters in Water Colours, was born in 1788. Although an extensive painter in oil, it was to water colours that his attention was most unremittingly directed; and in 1810 he first exhibited at the Old Water-colour Exhibition in Spring Gardens, of which Society on the death of Joshua Christall, he was elected president. His career, as a first-rate artist, was attended with the most deserved success; and his productions always commanded the highest prices. Five of his pictures, exhibited at the British Institution, and of recent execution, testify how little the powers of his youthful genius had abated. Never, perhaps, did the pastoral beauty of his pieces exceed that of Bolton Abbey, or the commingling colours of a distant landscape produce a more happy effect than in the view of Dunstaffnage Abbey. Indeed the almost uniform merit of this artist's various productions will preserve his fame to a remote posterity. He died in 1855.

FIFESHIRE (vi. 174-7). According to the census of 1851, the population of the county was 158,546, and inhabited houses, 24,610. The population of the principal places was as follows:—

St. Andrew's pa.	6,740	Dumferline bor.	13,836
——— bor.	5,107	Dysart . par.	8,739
Anstruther .	1,526	——— . . bor.	8,041
Auchtermuchty par.	3,704	Inverkeithing. . par.	2,499
——— bor.	2,673	——— bor.	1,852
Burnt Island pa.	3,158	Kilrenny par.	2,194
——— t.	2,724	——— . bor.	1,862
Crail . . par.	1,903	Kinghorn par.	3,080
——— . . . t.	1,247	——— . bor.	1,568
Cupar Fife par.	7,427	Kirkcaldy par.	5,719
———burgh.	4,005	——— bor.	10,475
——— bor.	5,686	Pittenweem par.	1,473
Dunfermline pa.	24,687	——— bor.	1,450
——— t.	7,860		

FIFTEENTHS, in the Middle-age, a tax or tribute imposed upon the various towns of the whole country, for the maintenance of the State. It was so called because it was the fifteenth part of what the town or city was anciently valued at. Sometimes the impost, like our modern income tax, extended to the fifteenth part of a man's personal income.

FILA'RIA (Lat. *filum* a thread), a genus of Entozoa, or intestinal worms, of the order *Nematoidea*, found in insects and their larvæ.

FILI'GREE (Lat. *filum* a thread, and *granum* a grain), an ornamental kind of work, in gold or silver, which has the appearance of threads or grains,—the filaments being braided and festooned in different ways, according to the taste or skill of the artist. In India the art is extensively practised; and the articles usually made in gold and silver filigree, are brooches, ear-rings, bracelets, caskets, small boxes, groups of flowers, chains, &c. But the design best adapted for displaying the delicacy and beauty of filigree is that of a leaf; the working of which is thus described by Mr. Taylor, in his 'Account of the Arts in India.' After observing that the design should be drawn on stout paper, and of the exact size of the article intended to be made, he says, 'The apparatus used in the art is extremely simple, consisting merely of a few small crucibles, a piece of bamboo for a blow-pipe, small hammers for flattening the wire, and sets of forceps for interweaving it. The gold and silver wire made by the Hindoos for this and other purposes is of varied character, according to the purposes for which it is intended; thus the *goolabatoon* is made at Dacca, for the embroidering of muslins and silks; *goshoo*, for caps, and for covering the handles of chowries; *sulmah*, for turbans, slippers, and hookah-snakes; and *booiun*, for gold lace and brocades. For some of these purposes it is not strictly wire, but gold thread; that is, silk covered with silver, and then with gold.'

FINE ARTS. [ARTS.]

FINGAL CAVE. [CAVERNS, *Suppl.*]

FINGERING, a term applied to the execution of musical pieces on the pianoforte or organ. Proper fingering is one of the first things to which a teacher should attend, as without this qualification, the pupil will never succeed in acquiring an easy and graceful execution. There is a great variety in the dispositions of notes, which can only be fingered in one particular way; and any deviation from this is productive of awkwardness or inelegance. It is therefore obvious that just fingering, in the execution of a musical piece, is of the first importance; and in the attainment of this art the instruction of a skilful master will be found necessary.

FIORDS OF NORWAY, a term of Norse origin, analogous to the Scottish *firth*, and applied to those wild and romantic inlets of the western coasts of Scandinavia, which are remarkable for the extraordinary crystalline transparency of their waters. So perfectly clear are these waters, that the reflection of the mountains is as well defined upon their surface as the rocks themselves, from which it is often difficult, at a little distance to

distinguish the line that separates the coast from the water. When crossing one of these fiords in a boat, a most singular appearance presents itself. All objects reflected in the water—houses, trees, hills, or animals—appear upside down, which for the moment entirely deceive the senses.

The clearness and singular effect of the waters of these northern fiords have been described by Sir A. Capell Brooke, in his interesting tour along the Scandinavian coast. After observing that the minutest objects could be seen at the bottom of the sea, where the depth was from forty to fifty yards,—he proceeds to observe that 'the surface of the ocean was unruffled by the slightest breeze, and the gentle splashing of the oars scarcely disturbed it. Hanging over the gunwhale of the boat, with wonder and delight I gazed on the slowly-moving scene below. Where the bottom was sandy the different kinds of asteriæ, echini, and even the smallest shells, appeared at that great depth conspicuous to the eye; and the water seemed, in some measure, to have the effect of a magnifier, by enlarging the objects like a telescope, and bringing them seemingly nearer. Now, creeping along, we saw, far beneath, the rugged sides of a mountain rising towards our boat, the base of which, perhaps, was hidden some miles in the great deep below. Though moving on a hard surface, it seemed as if we were ascending the height under us; and when we passed over its summit, which rose to appearance within a few feet of our boat, and came again to the descent, which on this side was suddenly perpendicular, and overlooking a watery gulf, as we pushed gently over the last point of it, it seemed almost as if we had thrown ourselves down this precipice, the illusion, from the crystal clearness of the deep, actually producing a sudden start. Now we came again to a plain, and passed slowly over the submarine forests and meadows, which appeared in the expanse below; inhabited doubtless by thousands of animals, to which they afford both food and shelter—animals unknown to man; and I could sometimes observe large fishes of singular shape gliding softly through the water thickets, unconscious of what was moving above them. As we proceeded, the bottom became no longer visible; its fairy scenes gradually faded to the view, and were lost in the dark green depths of the ocean.'

FIRE-BRIGADE, an organized body of firemen, in cities and large towns, caparisoned and trained to do duty at conflagrations. They are held in constant readiness to proceed with fire-engines and buckets, to assist in extinguishing fires; and they have been found extremely effective in all cases of sudden fires.

FIRE-CRACKERS, in pyrotechny, a preparation of gunpowder, &c., discharged for amusement at routs, or public fêtes. The Chinese are famous for the manufacture of these crackers, and a large trade is carried on from China to the United States. They are chiefly exported from Canton, in boxes of forty packets each, and sell at about 12*s.* the box, averaging in value about 50,000*l.* per annum.

FIRE-DAMP, the explosive carburetted hydrogen gas of coal-mines, and other subterraneous recesses, which exhales from pent-up earthy bodies, and often proves fatal to those who breathe it. Fire-damps are distinguished by the workmen into two kinds—the fire-damp and the choke-damp. The first is composed of hydrogen gas, which rises to the roof of the workings, and explodes with great violence. The choke-damp consists of carbonic acid gas, and more usually pervades those places which have been formerly worked, and often neglected. This damp is highly pernicious, and almost instantly suffocates those exposed to its influence. The safety lamp, invented by Sir H. Davy, and which is now in general use, is the greatest preservative against danger with which science is acquainted.

FISHERIES (vi. 207). According to the report of the Commissioners of British Fisheries, for 1855, the herring fishery has formed a most important and prosperous trade. The returns are the third highest on record. In cured herrings they exceed, by 130,141 barrels, the returns of 1854, the gross cure of 1855 having been 766,703½ barrels against 636,562½ in 1854. Of this very large cure there were branded 280,581½ barrels, or more than one-third of the whole quantity. The demand for Scotch fishermen has improved. Their boats are larger, and their fishing tackle much more complete. They find that their services are more in request, and begin to be appreciated. Hence they discover that skill in fishing, knowledge of the tides and currents, and haunts of the fish, are qualities which command for them the position of artisans in other vocations. Accordingly the remuneration for their labour has advanced, and the fishermen have largely benefited by the prosperity of the fisheries. The cod and ling fisheries of Scotland present an increase of nearly 10,000 cwt. over those of 1854, which again were an increase over those of 1853; the abstract 'boat account' of the Commissioners showing that, in 1855, 11,747 boats, manned by 41,602 fishermen and boys, were employed in the shore-curing department of the fisheries; while the total number of persons engaged in the fisheries was 94,155, being an increase over 1854, of 1243 fishers, and 26,321 persons in the total number employed. Herrings have largely increased on the Continent; for the export has exceeded by 106,136 barrels that of the preceding year, the export of 1855 having been 344,029 barrels against 237,893 in 1854. This prosperity of the British fisheries has produced a very beneficial effect on the fishing towns and their inhabitants. The towns have presented improved dwelling-houses, and the provision and clothing shops have largely increased. The social position of the fishermen and their families has also improved.

FISH-HOOKS, barbed instruments, of various sizes, used by anglers for catching fish. Their manufacture affords employment to a great number of hands. In making them, straight wires of the proper length are flattened at one end, and the barb is formed by a smart blow with a chisel. After the point is properly sharpened, the required curve or twist is given to

the hook. In order to impart to it the stiffness and elasticity of steel, the soft iron is case-hardened, by sudden immersion into heated charcoal. Finally, the hooks are brightened and duly tempered for use.

FISH-MEASURES, for selling and estimating fish, are almost of endless variety, and differ with the locality or the particular kind of fish. Salmon, cod-fish, herrings, haddocks, &c., have all their peculiar measures, which, in Simmond's 'Dictionary of Trade Products,' are thus enumerated. Salmon is sent to market in boxes of 120 lbs. to 130 lbs., containing about fourteen fish; codfish in barrels, containing about fifty fish, and is sold by the quintal or cwt.; a barrel of herrings is 26⅔ gallons, and contains about 700 fresh fish, or 500 smoked; a basket of bloaters contains about 150; a crau of herrings is 37½ gallons; a mace or mease of herrings is 600 fish; a cade of herrings 500 fish; a long hundred 132; a cade of sprats 1000; a barrel of pilchards is 41⅔ gallons, and 3000 pilchards weigh about 40 lbs.; a barrel of haddock contains about 300 fish; a stone of fish is 14 lbs.; a last of codfish is twelve barrels; a last of herrings 100 long hundred, or 13,200; a barrel of anchovies 30 lbs.; native oysters are sold in kegs of 16 lbs., containing about five score; or in barrels of 1600. Dried sprats are sold in bundles of thirty; cockles and whelks wholesale by the bushel; shrimps by the gallon; periwinkles and mussels by the basket.

FISH-SKIN, the covering of the flesh of marine animals, is used in the arts for a variety of purposes. Thus the rough-skin of the shark, or dog-fish, is used by white-smiths, cabinet-makers, type-founders, and others, as an abrasive material for smoothing metals and wood-work. The skins of the seal, porpoise, beluga, &c., are brought into use by tanning; and a sort of shagreen is made of fish-skin. Sole skins are used for clarifying coffee and liquors; and eel-skins are converted into strong ropes for connecting the swiple and hand-staff of a thrashing-flail, and for many other similar purposes.

FISSIPEN'NÆ (Lat. *fissa* and *penna*, a divided wing), nocturnal lepidopterous insects, in which the wings are split longitudinally, and resemble feathers.

FISTULA'NÆ (Lat. *fistula* a pipe), in conchology, a genus of the *Tubicolæ*, furnished with a tubular and calcareous sheath.

FLANK, a term of very general application in military tactics, intended to denote the side of an army or battalion from the front to the rear. Thus the *outward flank* of a division is the extreme file on the right or left; the *leading flank*, in manœuvring, is the first division or battalion which leads the attack; the *inward flank* is the first file, or the left of a division, regiment, or company; a *flank company* is a certain number of men drawn up on the right or left of a battalion; *flank files* are the first two men on the right, and the last two on the left; *flank in potence* is any part of the right or left wing, formed at a right angle with the line; to *outflank* is to outstretch the enemy's forces, so as successfully to attack his flank; to *turn the flank* is to pass round the side, and defeat the intended operations of the enemy. In fortification the term applies to any part of a work which defends another along the outside of its parapet. Thus the *flank of the bastion* is that part which joins the face to the curtain; the *flank fichant* is that portion of the walls from which the fire is directed on the opposite bastion; the *oblique flank* is that part of the curtain from which the face of the opposite bastion may be seen; *flank razant* is the point from which the line of defence commences; the *flank prolonged* is the extension of the flank from the angle of the epaulement to the exterior side; the *covered flank* is the platform of the casement, which lies concealed in the bastion; and the *flanks of a frontier* are the different points of a large extent of territory. To *flank* an enemy, generally speaking, is to erect a battery which may play on his works both right and left without being exposed to his fire. (*Mil. Encyc.*)

FLAX (vi. 224–6). Among the various schemes which have been attempted of late years, for improving the preparations of flax, that of Chevalier Clausen is the most deserving of attention. It is a process that gives to flax some of the qualities of cotton, which the inventor thus describes:—'The separate fibres were cut into short pieces, steeped in a solution of bi-carbonate of soda, and then steeped in slightly-acidulated water; the pores became filled with these two liquids; a chemical action ensued between the acid and the alkali; carbonic acid gas was formed within the little tubes, and the tubes were burst by this gas.' This split fibre has many of the qualities of cotton fibre; and the Chevalier gives to it the name of 'British cotton,' which can be bleached by chemical agency in the same way as cotton in the great Lancashire cotton works. Hence we have flax materials under different names, according to its combinations with other articles, as *flax-cotton*, *flax-silk*, *flax-wool*, &c.

In this Clausen process of cottonizing flax, there is something extremely beautiful, independently of its commercial advantages. The fibre of the flax is a kind of cylindrical tube, while that of the cotton resembles a flat ribbon; and the former is less pliant than the other; but by bursting open the flax-tube by chemical agency, and thus reducing the fibre to ribbon-shape, the inside as well as the outside of the tube is exposed, and new properties appear to be developed. At a late meeting of the Royal Agricultural Society (as described in 'Novelties, Inventions,' &c.), some flax was 'cottonized' in presence of the members. It was steeped in alkaline liquor selected by Clausen, and in that state appeared like a damp rigid mass; but as soon as it was exposed to the acid, by which carbonic gas was generated, and the fibres burst, the whole of the flax spread out into an expansive mass of cottony texture, like leavening dough or expanding sponge. The result is described as having been very striking; for the spectators saw both the beginning and the end of the process during an ordinary sitting.

As to the commercial advantages of the discovery, it has been asserted that one pound of ordinary flax, spun to a certain degree of fineness,

will produce 21,000 yards of yarn; while one pound of split or 'cottonized' flax will yield 25,000 yards. This alone renders the discovery deserving of national consideration.

FLAX-MILL, a large building where the fibrous material of flax is worked into the state of yarn, and prepared for being woven in other establishments; for these mills do not weave flax into linen or other finished goods,—this operation giving distinct employment to thousands who work chiefly at their own houses with hand-looms. Of the numerous flax-mills in the kingdom, that of Messrs. Marshall, at Leeds, is the largest and most important. It consists of one extensive room, which is nearly 400 feet long, and more than 200 wide. The vaulted roof, formed of seventy domes, is supported by ranges of iron pillars; and the warming, ventilation, and general arrangement of machinery, may be considered as the completest in the world. At this establishment, it is said, no less than 70,000 lbs. of flax are worked up weekly into yarn; and the various operations through which the raw material has to go, before it leaves the flax-mills, afford the most wonderful examples of mechanical ingenuity and human industry. The different machines employed for the purpose are briefly described by the editor of 'Novelties, Inventions,' &c. He first mentions the *flax-seeding* machines, for separating the seed from the stem, by the careful action of rollers. Then come the *flax-breaking* machines, with fluted or grooved rollers, between which the flax stem is made to pass; so that the woody portion becomes thoroughly broken without cutting the fibre. Next come into operation the *flax-scutching* machines, in which revolving arms or blades visit the flax with such vigorous blows that the woody fragments are nearly beaten out, and the fibres to a certain degree separated. After this the *flax-heckling* machines give the flax a thorough combing, by means of long rows of teeth or spikes; the fibres are combed out straight and thereby clean; and the *tow* or short fibres are removed, to be used for other purposes. The heckled flax is then in a state to be acted on by the various machines which bring it into the state of yarn for weaving. These machines are of three kinds, according as tow, long flax, or cut flax is to be acted upon. The *tow-carding* and the *tow-roving* machines serve for the first kind; the *flax-spreading*, *flax-carding*, and *flax-roving* machines for the second; and the *flax-cutting* machine, followed by those for carding and roving, for the third. The spinning machine follows all these; and it differs from cotton-spinning machines chiefly in having a provision for welting the flax either with cold or hot water. There is still a little gum or mucilage among the fibres, and this becomes more manageable in the machine when moistened. All the machines here named are the modern or factory means of operation. In old times all was done on the hand method, and the machines have been very gradually introduced.

FLECHE (Fr. *an arrow*), in fortification, a work resembling a redan, except that it is raised upon the terreplein, and not protected by a ditch. It is, in fact, a field-work, with faces and small flanks hastily run up to shelter a small number of men, and form an outwork to some more powerful fortification. (*Mil. Encyc.*)

FLIGHT OF BIRDS. Various calculations have been made as to the velocity with which some of the winged tribe pass through the air, especially birds of migratory habits. The slowest flight of swallows may be estimated at a mile a minute, or sixty miles an hour; so that, aided by the wind, they soon reach the warmer climates when the season of migration arrives. But Spallanzani calculates that the swallow can fly at the rate of ninety-two miles an hour; and that the flight of hawks and several other tribes may be computed at 150 miles an hour.

FLINTSHIRE (vi. 236-9). According to the census of 1851, the population of the county was 68,156; and the inhabited houses 14,041; the entire area 289 square miles, or 184,905 acres. The population of the principal places was as follows:—

St. Asaph	par.	3,576	Holywell	par.	11,301
———	t.	2,041	———	bor.	5,740
Bangor	par.	9,564	Mold	par.	10,893
———	bor.	6,338	———	bor.	3,432
Flint	par.	2,845	Rhuddlan	par.	3,049
———	bor.	3,296	———	bor.	1,472

FLORIA'NI, an ancient Christian sect of the second century, who made God the author of evil, and taught the Gnostic doctrine of a good and evil principle. They were so called from Florianus, a disciple of St. Polycarp.

FLORIN, a silver coin of different values in different countries. [MONEY.] The English florin is one-tenth of a pound, or 2s., and not only admirably executed, but well adapted for forming the basis of our decimal coinage, by simply declaring it equivalent in value to 100 farthings instead of 96. [DECIMAL SYSTEM, *Supplt.*] The present florins were declared in 1852, by royal proclamation, to be the current and lawful money of the United Kingdom,—a previous issue having been withdrawn from circulation, on account of the letters DEI GRATIA having been omitted on the exergue. On the obverse of the florin now in circulation is the royal effigy crowned, and the inscription 'Victoria D. G.; Brit. Reg. F. D.' On the reverse of the coin are the armorial ensigns of the United Kingdom, contained in four shields, crosswise, and also the crown and floral emblems, the whole surmounted by the words 'One florin, one tenth of a pound.'

FLOS-FERRI (Lat. *flower of iron*), a mineral which occurs in small cylinders, with a fibrous structure and a white silken-looking surface. It is a variety of Arragonite, and is so called because it is generally found in veins of sparry iron.

FLOURISH, in music, a term applied to those decorative notes, which an instrumental performer, or a singer, adds to a passage, with the view of giving effect to a composition, or displaying his own flexibility or taste.

FLUATES, in chemistry, those salts which are formed by the combination of any base with fluoric acid. The principal fluoric salts are the fluates of lime, of soda, of ammonia, of silica, and

of alumina. These salts were first discovered by Scheele, and are distinguished by the following properties. When sulphuric acid is poured upon them, they yield a vapour which corrodes glass, and, which, when condensed in water, form liquid fluoric acid. Some of the fluates possess phosphorescent properties, and all of them combine with silica, when intensely heated in connection with that earth. They are not decomposed by heat, nor altered by combustibles; but most of them are slightly soluble in water. Fluate of lime is a salt which is very abundant in nature. Vast rocks in Derbyshire and elsewhere are formed of it. It has obtained the name of fluor spar, and is used for vases and other ornamental works.

FOHI, or FO, the principal deity of the Chinese, whose worshippers style him the only god of the world. He is usually represented as being invested with light, and his hand concealed beneath his robe, as symbolic of the invisible exertion of his power. The doctrines of Fohi are particularly propitious to every wish that can be formed in the human heart; and as they are not obstructed by any measures of the government, which allows perfect toleration, they cannot fail to spread among those classes of the people who are not satisfied with their prospects as resulting from natural causes. Judging from the number of images found in the temples of Fohi, we may safely conclude that the religion, when practically viewed, is a pure system of idolatry. *Poo-tala*, or grand temple of Fohi, as described by Sir G. Staunton, had not less than 800 priests attached to it. Though there is no state religion in China, the great mass of the common people belong to the sect of Fohi; and perhaps none are more superstitious. The temples are always open for those who choose to consult the decrees of heaven; and they return thanks when the oracle proves propitious to their wishes. 'The religion of Fohi,' says Sir G. Staunton, 'professes the doctrine of transmigration of souls, and promises happiness to the people on conditions which were, no doubt, originally intended to consist in the performance of moral duties; but in lieu of which are too frequently substituted those of contributions towards the erection or repair of temples, the maintenance of priests, and a strict attention to particular observances. The neglect of these is announced as punishable by the souls of the defaulters passing into the bodies of the meanest animals, in whom the sufferings are to be proportioned to the transgressions committed in the human form.'

FOLLET, SIR WM. WEBB, an eminent lawyer, was born at Topsham, county of Devon, in 1798. After having gone through the regular course of a liberal education, he entered himself as a member of the *Inner* Temple; and in 1828 commenced practice as a special pleader. In 1834 he was appointed solicitor-general under Sir. R. Peel's administration; and in 1835 received the honour of knighthood. In 1837 he was elected M.P. for Exeter; and on Sir F. Pollock's elevation to the Bench, in 1844, he succeeded him as attorney-general. He died in 1845.

FOO-CHOO-FOO, an important city of China, the capital of the province of Fookien, and one of the five places named in the treaty of 1842, where British subjects are allowed to reside and trade. [CHINA.] It is situated in lat. 26° N.; long. 119° 25' E. about thirty-five miles from the sea, and is about ten miles in circumference; the suburbs being as extensive as the city itself. It is regularly fortified in the Chinese fashion; and the streets and shops are of a very superior character. The neighbourhood of Foo-choo-foo is celebrated for the manufacture of China ware, and 500 ovens may be seen constantly at work. No place in China can produce such admirable specimens of ware. The wood used in burning it is brought upwards of 300 miles. The cotton of Foo-choo is particularly good, and the brilliancy of their blue dye is proverbial. About seventy miles from the city is the central depôt of the great black tea, or Bohea hills, whence the tea can be sent down to the ship's side in four days, at an expense considerably less than that which is now paid for its transit to Canton. A British Consul is always resident at Foo-choo, in conformity with the treaty of 1842.

FOOD ADULTERATION. Under the head of *Adulterations*, are mentioned the heavy penalties inflicted on bakers for the adulteration of flour, meal, or bread; but the system is not confined to these articles alone, for, according to the evidence of numerous scientific witnesses lately examined before a select committee of the House of Commons, it is evident that poisonous matters are largely used for colouring and flavouring in confectionery; that mustard is adulterated with turmeric and other substances; that chicory is adulterated with Venetian-red, carrots, and treacle; that beer and gin are extensively adulterated; that rice and alum are still used with flour in the making of bread; that drugs are largely adulterated; and that there is a regular trade in diseased meat. A drug-grinder, by the name of Gay, admitted that he had adulterated as much as any man in the trade, but that he had done his utmost to expose the system. He stated that he was obliged to add adulterating substances by order of the wholesale houses, and that he very seldom sent out genuine articles. Dr. Taylor, in his evidence, said that he thought adulteration extended so far as to be very injurious to the public, and that among the poorer classes especially a large amount of disease might be traced to improper food. This evil had arisen from the desire to sell cheaply, and thus supply the public with inferior articles at a reduced price; although it appears that there has been some little abatement of the pernicious practice since the investigations undertaken by parliament. But Dr. Taylor gave it as his opinion, that in order to put some check on the system of adulteration, now so extensively carried on, some public board should be established, consisting of a given number of scientific persons, to determine all questions of suspected adulteration.

FORAMEN (Lat. *a hole*), a word of extensive application in anatomy, applied to those openings in the animal body by which nerves or blood-vessels pass through the bones. They are known

by various Latin names, generally expressive of their position or situation; as the *F. incisivum*, or opening immediately behind the front teeth; the *F. magnum occipitis*, or the great opening at the under and fore part of the occipital bone; the *F. rotundum*, or the round aperture of the internal ear; with numerous others, which are more fully described in anatomical works.

FORBES, EDWARD, Regius Professor of Natural History in the University of Edinburgh, was born at Douglas, in the Isle of Man, in 1815. His earliest pursuits were devoted to the study of Natural History; and when quite a youth he compiled a Manual of 'British Natural History,' which has been highly appreciated as a useful work of reference. He commenced his career as a medical student at Edinburgh; but evincing a strong attachment for the study of zoology and botany, he determined on devoting himself exclusively to a scientific career. He accordingly visited the coast of the Mediterranean, and made the tour of Europe and of Norway. Several interesting papers were the result of these journeys; as 'Notes of a Natural History Tour in Norway;' 'Comparative Elevation of Testacea in the Alps,' &c. One of the most important of his systematic works, prettily illustrated by his own pencil, was his 'History of British Star-fishes and other Animals of the Class Echinodermata,' which was published in 1841, and attracted considerable attention among the learned. He afterwards received the appointment of Naturalist to H. M. Surveying Ship Beacon, which was commissioned to bring from Lycia the marbles brought to light by Sir Charles Fellowes. He undertook, in concert with the Rev. Mr. Daniell and Lieut. Spratt, to survey the coast of Lycia, and the result was the discovery of eighteen ancient cities, an account of which was afterwards published. He also brought out, in 1843, an interesting 'Report on the Mollusca and Radiata of the Ægean Sea, and on their Distribution, as bearing on Geology.' He was subsequently elected to the professorial chair of Botany at King's College, London, which he filled with great credit until his appointment to the chair of Natural History at Edinburgh. He afterwards became Librarian and Curator to the Geological Society, which was soon followed by his appointment to the Palæontological Department of the Museum of Economic Geology, which took place in 1846. From this period he was engaged in a variety of works connected with Natural History, the principal of which was a 'History of British Mollusca,' published in 1853, in four volumes. He was, besides, an extensive contributor to the 'Journal of the Geological Society,' the 'Athenæum,' the 'Literary Gazette,' the 'Westminster Review,' and the 'Quarterly Journal.' He had been elected a fellow of the Linnæan and Royal Societies. But in 1852 he was made President of the Geological Society, and in 1854 appointed President of the Geological Section of the British Association. In 1853 he obtained, what had long been the object of his ambition, the professorship of Natural History in the University of Edinburgh, where he was enthusiastically welcomed by professors and students. But he lived only to complete one course of his lectures. He died in 1855.

FORESTA'GIUM, in the Middle age a feudal duty payable to the king's foresters. (*Charter*, 18 *Edward I.*)

FORFARSHIRE (vi. 285-90). According to the census of 1851, the population was 191,264, and inhabited houses 22,446; the area of the county 889 square miles, or 568,750 acres. The population of the principal places was as follows:—

Aberbrothwick, or Arbroath, bo.		16,986	Dundee	. bor.	78,931
———	t.	8,302	———	royal b.	61,526
Brechin	. par.	8,210	Forfar	. par.	11,009
———	. bor.	6,637	———	. bor.	9,311
Cupar-Angus	p.	2,745	Kirriemuir	par.	7,617
———	t.	1,868	———	t.	3,518
Dundee	. par.	62,545	Montrose	. par.	15,822
			———	. bor.	15,238

FORNACA'LIA, movable feasts among the Romans, the celebration of which were proclaimed by the Curio, on the 12th of the Calends of May. They were first instituted by Numa, in honour of the goddess Fornax, from whom they received their name.

FORNA'GIUM, one of those feudal exactions, which required the tenant to pay a fee for the use of the lord's common oven, or even for permission to bake in his own. (*Plac.*, 18 *Edward I.*)

FORTIFICATION (vi. 296-301). The history of fortification, and a description of military fortresses, have already been given. The following is an alphabetical list, with brief explanations, of the principal terms in general use—the more important ones being described under their respective heads:—

Banquette, a step or elevation of earth, on which soldiers stand to fire over the parapet.—*Bastion*, a work composed of two faces and two flanks.—*Berm*, a space left between the exterior slope of the rampart and the ditch.—*Caponnière*, a work intended to cover the passage across the ditch.—*Cavalier*, a rampart situated on the terreplein of a bastion, and so constructed as to command some rising ground within cannon shot.—*Citadel*, a strongly-constructed fortress joined to the works of a place, which is the usual retreat of the garrison, when the town is taken.—*Cordon*, a semicircular projection of stone, placed at the slope of the escarp.—*Counterscarp*, the wall or slope forming the breadth of the ditch, opposite to the escarp.—*Covered Way*, an open space extending round the counterscarp of the ditch.—*Crownwork*, a kind of bastion between two curtains, which are terminated by half-bastions.—*Curtain*, that part of the rampart which lies between two bastions.—*Ditch*, an excavation surrounding the rampart.—*Embrasures*, openings cut through the parapets for firing cannon through.—*Enceinte*, the interior wall or rampart which surrounds the town.—*Envelope*, an earthwork raised in or beyond the ditch.—*Epaulement*, an elevation of earth, thrown up to cover troops from a flanking fire.—*Escarp*, the exterior slope or wall of the rampart.—*Esplanade*, a space of even ground, clear of buildings, situated between the citadel and town.—*Faces*, those parts which form a

salient angle, and project towards the country.—*Flank*, part of a work situated so as to defend some other spot.—*Fleche*, a parapet whose faces form a salient angle, and have communication with the covert way.—*Fougasse*, a small mine.—*Fraises*, a kind of palisades, or chevaux-de-frise, usually placed in the exterior slope of ramparts.—*Glacis*, the superior part of the parapet of the covered way, which forms a gentle slope towards the country, and covers the revetement of the body of the place.—*Hornwork*, a work composed of two half-bastions and a curtain.—*Loopholes*, oblong orifices, cut through masonry or timber for the use of small-arms.—*Lunettes*, works constructed on each side of ravelins.—*Outworks*, defences constructed beyond the body of a fortress.—*Palisades*, stakes of strong wood fixed in the ground, for the defence against a sudden attack.—*Parallels*, trenches formed to connect together the several approaches to a beleaguered town or fortress.—*Parapet*, a mass of earth elevated on the terreplein of the rampart towards the country.—*Ramp*, a road cut in the interior slope of the rampart.—*Rampart*, an elevation of earth, obtained by the excavation of the ditch.—*Ravelin*, a work constructed opposite the curtain, and composed of two faces, which form a salient angle towards the country.—*Redan*, a work consisting of two faces, with a parapet, &c., and forming a salient angle of about 60°.—*Redoubt*, a kind of field work, either circular, square, or polygonal, hastily thrown up for temporary defence.—*Revetement*, the masonry which retains the earth of the rampart on its exterior side.—*Sallyports*, openings cut in the glacis, which are used in making sallies from the covered way.—*Slope*, (*Interior*), the inclination of earth nearest to the town.—*Starfort*, a succession of salient and re-entering angles on the sides of a polygon.—*Tenaille*, a small work, with a parapet, consisting of two faces, and constructed between the flanks of the bastions in front of the curtain.—*Terreplein*, the upper part of the rampart, which remains after having constructed the rampart.—*Têtes de Pont*, works consisting of redans, constructed on the banks of rivers to protect the passage across them.—*Traverses*, parapets which cross the breadth of the covered way at the salient and re-entering places of arms, &c., intended to cover the troops from the enfilade fire of the enemy.—*Trench-cavaliers*, works raised by the besiegers on the glacis of a fortress, to protect them from the fire of the enemy.—*Zig-zags*, trenches made for the approaches from the parallels to the besieged place.

FORT-MAJOR, the commandant of a fort in the absence of the governor, who, if under the rank of captain, takes precedence as the junior captain of the garrison in which he is serving.

FOSS, or FOSSA (Lat. *an excavation*), in anatomy, a cavity in a bone with a large aperture, but no perforation. These apertures are distinguished by different names, usually expressed in Latin; as the *Fossa lacrymalis*, or a depression in the frontal bone for the reception of the lacrymal gland; the *F. ovalis*, or the oval depression presented by the septum of the right auricle; the *F. hyaloidea*, or the cuplike excavation of the vitreous humour in which the crystalline lens is embedded, &c.

FOSS-WAY, one of the four great English roads made by the Romans which led from Coventry, through Newark, Leicester, &c. to Cornwall. It received its name from being ditched on each side.

FOSSILS (vi. 305.) Innumerable theories have for ages occupied the attention of the learned, as to the origin and history of fossils; but the investigations and discoveries of geologists, in modern times, have at length arrived at something like practical results. The fact that every series of stratified rocks contains fossils peculiar to itself, was first discovered by Lister above a century and half ago; but the principal merit is due to Mr. Wm. Smith, commonly called the father of English geology, who, without the advantages of wealth or patronage, conducted a series of laborious investigations of the stratified formations in the southern and midland counties of his native country, and thus established a system of fossilization, which Professor Sedgewick has declared to be 'the master principle of geological science.' He demonstrated that each stratum of the earth's crust, wherever it occurred, even in the most distant localities, presented its own peculiar species of fossils, and might be identified by these characteristic marks. Thus by exhibiting a particular fossil, it might be demonstrated from what rock, or particular stratum, the specimen had been derived. The doctrine was thus established, that there had been a succession of vegetable and animal organisms in the ancient earth; and that, during the various formations of its stratified crust, different races of plants and animals, as exhibited in the fossils, had appeared at one age, and altogether vanished in another. Fossils thus afford numerous links in the great chain of organized beings, and explain difficulties which would otherwise be inexplicable. They teach us the important truth, says Professor Ansted, that 'through all time there has been a perfectly uniform plan pursued in the construction of the world, and its adaptation for successive races of beings, but that this plan has admitted of innumerable modifications in the mode of carrying it out—all evidently and admirably adapted to changing circumstances. But the one principle involved in the whole subject of fossils—the means by which we determine their nature, and discover the value of the evidence they yield—is still derived from the study of existing nature. No new principle is introduced—no new or different method discovered; nature is still, in all essential points, the same, and has been the same throughout all time. All that we can know with certainty, with regard to the past, is derived from the study of the present, and we are confident of the truth of the history these fossils teach us, because, and only because, that history does not involve any considerations that disturb the harmony and the uniformity of action of the great laws of organic existence.'

Thus the use of fossils is of the first importance in geological investigations. They not only tell us of the former existence of animals and vege-

tables entirely different from the present, but they afford an unerring clue to a knowledge of the different periods of the earth's crust. They are, in truth, the very hieroglyphics of nature, which mark the condition of the earth at the place and time of their deposit. They exhibit the most certain proofs of a long series of successive creations, characterizing, at the same time, the different epochs of the earth's external formation. They thus form the groundwork of geological classification.

But of all the fossilized remains which modern researches have brought to light, the bones of animals are the most striking and curious. Baron Cuvier, who, as the first zoologist of the age, united in his own person every qualification for the task, undertook the study of animal fossils, and learnt the art of restoring these records of the earth's primæval history to their original forms. He collected the fragments of which they consisted, and thus produced the representations of the living originals, by which he was enabled to compare them with those animals of cognate genera now living on the surface of the globe. Being assisted in his researches and experiments by some of the ablest naturalists and geologists of modern times, he was enabled successfully to determine the form and character of many extraordinary animals.

To our own countrymen in particular (Professor Owen and Mr. Hawkins), are we deeply indebted for the extraordinary skill with which they have succeeded in restoring and presenting models of many gigantic animals of primæval ages, which are now exhibiting in the gardens of the Crystal Palace at Sydenham. Among these may be mentioned the Megatherium, the Irish Elk, the Anoplotherion, the Megalosaurus, the Iguanodon, the Ichthyosaurus, the Pterodactyle, the Plesiosaurus, the Labyrinthodon, and others. The key with which Professor Owen contrived to decipher the mystic records of geological ages is as certain as that with which Champollion or Young contrived to unlock the mysterious hieroglyphics of ancient Egypt. 'To attempt to produce, for the instruction of the world, representations of those extinct species which existed in our globe thousands of ages before the birth of man,' (says Mr. McDermott, in his 'Guide to the Crystal Palace,') 'was a proceeding not less bold than novel on the part of the Directors of the Crystal Palace. Scientific men, who had devoted a long life to the accumulation and study of fossil remains, who had put together the skeletons of these gigantic monsters, and seen them in imagination roaming over the pathless forests of our island, had never yet beheld the entire animal reproduced before them; geologists were for the first time to gaze upon the fruit of their industry, and the results of their science.'

(Baron Cuvier; Professor Ansted; Professor Owen.)

FOSSO'RES (Lat. *diggers*), in Entomology, a family of *hymenopterous insects*, which are furnished with wings, and each individual armed with a sting.

FRANCE (vi. 334–61). Since the revolution of 1848, which expelled Louis-Philippe from the throne, some important political changes have taken place. At the election of the members of the National Assembly for Paris, Louis Napoleon, the present Emperor of the French, was returned, in May 1848, as representative of the Seine, by the extraordinary number of 119,752 votes. The debate on the new constitution, which had lasted from the 4th of September, terminated on the 23rd of October, and was finally passed on the 4th of November. The constitution was declared to be purely republic; and to consist of a president, to be elected for four years, by the universal voice of the nation, and of a single legislative chamber, the members of which were to be elected by ballot and universal suffrage, for the period of three years. The elections were to be by departments; and the number of representatives to be 750. The election of president was fixed for the 10th of December; when Louis Napoleon was returned by nearly six millions of votes. On the 20th of December he was duly inaugurated by the National Assembly, and took his oath to the new constitution. A great struggle, however, soon commenced between the different interests which the revolution had raised to importance in the State. The National Assembly did not appear disposed to abdicate its powers. It was, however, dissolved in May following; and the general election plunged the country into a state of great excitement; for of the twenty candidates returned for the department of the Seine, ten were Socialists. The Assembly met on the 2nd of June in the old Hall of the Chamber of Deputies. Ministerial changes soon followed; and the spirit of party became extremely violent. The removal of the trees of liberty, early in 1850, gave rise to some disturbances in Paris; but they were soon suppressed. In the meantime Napoleon was acquiring great popularity by his politic measures; and during his tour through the provinces he called forth the most lively enthusiasm. On the meeting of the Legislative Assembly, in November, a long message from the president was read by the Minister of the Interior, which met with general approbation. During 1851 the contests between the legislative and executive powers became daily more hostile, as the period for Louis Napoleon's term of presidency approached. A great and final struggle was inevitable; for the government had not only to contend with the Assembly, but with Generals Changarnier, Cavaignac, and others possessing great political influence. At length the Legislative Assembly becoming alarmed at the attitude assumed by the president, sought to have an armed force placed at the disposal of its own president; but the motion was rejected by a small majority. An attempt was next made to determine the responsibility of the president and his ministers. The measures proposed were so hostile to the government, that Napoleon determined upon immediate action; and the memorable *coup-d'état* of December 2nd was the result. Early on the morning of that day, the following decree was issued, and carried into effect by the overwhelming military forces of Paris:—

'In the name of the French people, the President of the Republic decrees:—1. The National Assembly is dissolved;—2. Universal suffrage is established. The law of the 31st of May is abrogated;—3. The French people is convoked in the elective colleges from the 14th of December to the 21st;—4. The state of siege is proclaimed throughout the first military division;—5. The Council of State is dissolved;—6. The Minister of the Interior is charged with the execution of the present decree.'

The leading men of the capital, including Generals Changarnier, Cavaignac, Lamoricière, and others, were arrested; and the National Assembly dissolved. On the 31st of December, the people, by more than seven millions of votes, decided in favour of the continued maintenance of authority by Louis Napoleon.

Thus terminated the Republic of 1848, which had been struggling, from its commencement, with rebellion and anarchy. The *coup-d'état* of December 1851, which overthrew this ephemeral government, was accomplished almost without a struggle, and with little loss of life. It is true that, during the 3rd, 4th, and 5th of December, there was some street-fighting, and the authorities acted in a reckless manner in firing upon some defenceless multitudes; but few barricades were erected, and nothing like a determined resistance anywhere exhibited itself. The most reprehensible feature in these transactions were the arbitrary arrest and deportation of many distinguished personages, whose only crime was political hostility to the president and his government. In justification of Napoleon's conduct, however, may be urged the utter incapacity for legislation exhibited by the various factions, of which the National Assembly was constituted, and into which France was divided. Thus the despotism of one man, it may be said, saved the country from the more horrible despotism of the mob.

By a decree of the 11th of January, 1852, the National Guard throughout France was reconstructed on a fresh basis; and on the 14th the new constitution, which vested the government of the French Republic in the hands of Louis Napoleon for ten years, was duly promulgated. According to this constitution, Napoleon was to govern by means of ministers, a council of state, a senate, and a legislative assembly. The legislative power was to be exercised collectively by the president, the senate, and the assembly. Another electoral law was soon afterwards promulgated. The press was placed under restrictions; and the celebration of political anniversaries was prohibited, with the exception of the national fête, in commemoration of Napoleon's birthday, on the 15th of August.

On the following November the question of the re-establishment of the French empire was submitted to the people; when it appeared that 7,824,189 voted in its favour, and only 253,145 against it. Napoleon being thus almost unanimously elected to the empire, on the 2nd of December made his public entry into Paris, and took up his residence at the Tuileries. A decree was then issued, creating Louis Napoleon the Emperor of the French, under the title of Napoleon III.

On the 29th of January, 1853, the emperor was married to Eugenie de Montijo, Countess of Teba; by whom he has one son, who promises to perpetuate the dynasty of the Bonaparte family.

In consequence of the aggressive spirit of Russia, as manifested towards the Turkish Empire, France, in alliance with Great Britain, declared war against that colossal power, March 27, 1854. After many sanguinary conflicts, in which the Russians were signally defeated, the contest terminated by the capture of Sebastopol, and the treaty of Paris, which was signed in March 1856. [CRIMEA; RUSSIA; SEBASTOPOL; *Supplt.*]

Since Napoleon's accession to power, he appears to have acquired considerable popularity; and perhaps deservedly so, if we may judge from the many excellent public measures he has carried into operation, and the great national improvements (especially in Paris), which he has effected. The trade and commerce of the country have been prosperous, and the national finances in a flourishing condition. The exports and imports have also been large. According to the statistical summary of the trade and commerce of France, for 1852 (the first year of Napoleon's absolute rule), the exports and imports of the country amounted to 3,110,000,000 francs. During the same year there entered the ports of France, 18,702 vessels, the tonnage of which amounted to 2,439,704; and there cleared, the same year, 16,398 vessels of 1,863,226 tons. The value of machines exported in 1852 was valued at 5,835,046 francs; articles of millinery and dressmaking, 4,947,614 francs; wines, 2,486,974 hectolitres; corcals, 4,157,642 francs; salt, marine or saline, 1,088,829 metrical quintals; refined sugar, 160,058 met. quintals; woollen fabrics, 57,396 metrical quintals. The value of woollen cloth was estimated by M. Thiers at 355,000,000 francs; and the manufacture of silk goods is the largest in the world.

The exports of books and paper have been enormous. During the years 1854, 1855, and 1856, the weight of books exported, in various foreign languages, was 723 tons, English; and their value 289,000*l.* The weight of books in the French language, exported in the same three years, was 4320 tons, and the value of them about 1,300,000*l.* Paper exported in the said three years weighed 23,000 tons, and was worth 1,574,000*l.*; engravings and lithographs, 518 tons, of the value of 727,000*l.*; geographical maps, 28 tons, of the value of about 17,000*l.*; music, 95 tons, of the value of 46,000*l.*; and printing characters, 253 tons, of the value of 40,000*l.* As regards books, the largest export was made to Belgium, and the next largest to England;—that to the former country exceeding 350,000*l.* in the three years, and to the latter exceeding 160,000*l.* To the United States it was about 64,000*l.*; to Germany, about 60,000*l.*; to Spain, 60,000*l.*; to Sardinia, 80,000*l.*; to Portugal, 36,000*l.*; to the Two Sicilies, 31,000*l.*; to Tuscany, 35,000*l.*; to Switzerland, 83,000*l.*; to Russia, 14,000*l.*; to the Papal States, 4,000*l.*; to Turkey and Egypt, 24,000*l.*; and to Mexico, 56,000*l.*

The countries with which the chief com-

mercial relations are conducted, are the French colonies, Belgium, Switzerland, Sardinia, England, Germany, Spain, and especially the United States of America; the imports from, and exports to which, amount to one-fourth of the whole external commerce of the country.

The revenue of the French Empire is derived from direct taxes, amounting at present (1858) to 18,344,499*l.*; indirect taxes, 43,270,320*l.*; other sources, 5,941,160*l.*; giving a total of 67,555,979*l.* as the ordinary income of the State. In 1852 the revenue was estimated at 57,976,544*l.*; and the national expenses at 60,135,953*l.* But since the revolution of 1848 the increase of the national liabilities is represented by an increase in the amount of dividends paid, equal to 5,520,000*l.* yearly, of which 2,640,000*l.* has arisen from debts contracted by the Revolutionary Government, and 2,880,000*l.* by the Empire. The total amount of increased dividends has, however, been reduced by a sum of 720,000*l.* through the conversion of the Five per Cents into Four-and-a-half.

In 1853 the French army consisted of 404,500 men, of whom 60,000 were cavalry. At the same date the navy comprised forty ships of the line, fifty frigates, forty corvettes, fifty brigs, forty-six transports and boats, in all 226 sailing vessels and 102 steamers, comprising ten frigates, forty corvettes, and fifty-two smaller vessels. But since that period great additions have been made to her military and naval strength. According to a work published by Mr. Wraxall (in 1858), the military force of France is computed at 566,000 men; with an organized reserve of 180,000, and 100,000 national guards. Her navy consists of 328 vessels, including 53 sail of the line, all of which would require 96,000 sailors to man them.

The entire population of France, in 1851, was estimated at 35,781,628; the department of the Seine having a population of 1,422,065; and that of the Nord 1,158,285; these two departments being the most populous. The mean annual increase of population is 156,333, or the 212th part of the whole. The population increases one-tenth in twenty years, two-tenths in thirty-nine years, three-tenths in fifty-six years, four-tenths in seventy-two years, and one-half in eighty-six years. There is annually one birth to every thirty-four inhabitants, or 100 births to eighty-four deaths. There is one death to every forty inhabitants, and one marriage to every 128. The average duration of life is at present thirty-seven years and seven-tenths. Before 1789 it was only twenty-eight and three-quarters. The annual average of boys to girls, in legitimate birth, is as seventeen to sixteen; while with illegitimate children the proportion is twenty-six males to twenty-five females. There still is found one illegitimate birth to thirteen legitimate ones. The annual number of deaths of males is greater by one seventieth than that of females.

In January 1858, an atrocious attempt was made on the life of Napoleon by some Italian refugees, through the means of hand-grenades, which were thrown under his carriage, when he, along with the empress, was about to enter the Opera-house. Both the imperial personages escaped uninjured; but several individuals, among the surrounding crowd, were either killed or wounded. Four of the assassins were taken, and two of them, Orsini and Pierri, were tried and executed.

FRANK-PLEDGE, in the feudal age, a kind of surety for the good behaviour of freemen, according to which, every free-born man (excepting clerks, &c.) should, at the age of fourteen, give security for his fidelity to the king and his officers. The custom was so rigidly observed, that at every county court the sheriffs called upon all those persons, who had arrived at the proper age, to take the necessary oaths, and settle themselves in one Decennary or another; and this branch of the sheriff's authority was called 'The View of Frank-pledge' (*Visus franci plegii*). Sometimes a certain number of neighbours became bound for one another, and were accountable for the appearance of their pledge, when called upon. Frank-pledge was very ancient, and its origin assigned to the Lombards. The custom of *Friburg*, as existing among the Saxons, was of the same nature; though persons of importance were exempt, as they were considered a sufficient assurance for themselves and their servants. (Skene.)

FREYA, or FREGA, the name of one of the principal goddesses in northern mythology, who was worshipped, as the goddess of love and pleasure, by the Saxons, Danes, and other northern nations of Europe. The sixth day of the week was consecrated to her, and still bears her name —Freya-day, or Friday.

FRIENDLY SOCIETIES (vi. 408). These societies appear to be now established, in some shape or other, in all the civilized countries of Europe. In this country, more especially, they have been taken under the ægis of the government; and several Acts of Parliament have been passed for their due regulation, particularly the statute of 9 and 10 Vict. (1846), as already noticed. According to the report of the Registrar of Friendly Societies, there appeared, in 1856, to have been, in the whole of the United Kingdom, 9,046 depositors—whose entire investments amounted to 1,408,262*l.*, being an average of nearly 156*l.* each person. But if we include the savings banks and charitable societies, the number of depositors is increased to 1,341,672, and the amount of deposits to 34,946,012*l.*, or an average of 26*l.* each. Indeed so large has been the increase of savings bank depositors of late years, that they are now five times more numerous than the persons entitled to receive dividends on the public debt of the United Kingdom. According to the Registrar's report, just mentioned, there were 186,352 depositors whose average deposits were only 5*s.* each; 619,208 depositors (nearly one-half), whose investments were under 10*l.* each.

FRONTAL, a term of very frequent application in anatomy and physiology; as the *frontal bone*, which is situated at the anterior part of the cranium, and forms the forehead, as developed and illustrated by Camper's facial angle. [FACIAL ANGLE, *Supplt.*] The *frontal sinuses*, which are two cavities in the substance of the ethnoid bone; the *frontal suture*, which divides the os frontalis

in the fœtus; *frontal bosses*, two prominences on each side of the external surface of the frontal bone; *the frontal muscle*, situated in the interior hollow of the frontal occiput; the *frontal artery*, which forms a branch of the ophthalmia, distributed on the forehead; the *frontal crest*, which is situated at the exterior extremity of the frontal groove, and gives attachment to the falx cerebri.

FRY, MRS. ELIZABETH, the distinguished Christian philanthropist, emphatically called 'The Female Howard,' was the wife of Joseph Fry, Esq., of Upton, Essex, and sister to Lady Fowell Buxton. Her whole life was devoted to the dispensing of Christian charity, and administering spiritual consolation and aid to the unfortunate inmates of our prisons. She died in 1845.

FUCAGE, in the Middle age, a sort of hearth money, paid for every chimney in a house. Thus the Black Prince, in the reign of Edward the III., levied twelvepence for every fire on the subjects of the Duke of Aquitania.

FUCA'CEÆ (Lat. *fucus* a sea-weed), an order of the Algæ, known as seawracks, which are generally found in the ocean, but sometimes in fresh water.—*Fuceæ* is a sub-order of the above, in which the frond is often bladdery and polysiphonous.

FUENTES D'ONORE, a small town of Spain, near Ciudad Rodrigo, memorable for a sanguinary battle fought in 1811 between the British troops under Lord Wellington, with 35,000 men, and the French under Marshal Massena, with 51,000; in which the former were victorious, the French having sustained a loss, in killed and wounded, of 5000 men, and the British 2000.

FULLING, the art or practice of scouring, cleansing, and thickening cloth, serges, and other stuffs, in a mill, by which the material becomes more compact, firm, and durable. The usual method of fulling may be thus described. A coloured piece of cloth is laid in the trough of a fulling mill. For a piece of 45 ells, about 15 lbs. of soap is required, one-half of which is to be melted in two pails of hot water. The solution is poured gradually upon the cloth, in proportion as it is laid in the trough, without any fresh soap, and there fulled two hours more. After this, the cloth is taken out, and well wrung in order to squeeze out the dirt and grease. After the second fulling, the rest of the soap is dissolved as in the former case, and cast four times on the cloth. The cloth is then to be taken out, and well stretched every two hours. When sufficiently fulled, and brought to the proper quality and thickness, it is scoured in hot water; and kept in the trough till it is quite clean. For white cloths a considerable less quantity of soap, as well as of labour, is required.

The art of fulling was not unknown to the ancients. According to Pliny (lib. vii. c. 56) it was invented by Nicias, a governor of Greece, during the Roman domination. Among the Romans the fullers scoured, washed, and fitted up clothes; and their art was considered of such importance, that various laws were passed for regulating the manner of performing it.

FULMINATING POWDER, an explosive compound, consisting of three parts of nitre, two of potass, and one of sulphur, all well dried, and mixed together in a warm mortar. It is to the sudden action of the sulphuretted hydrogen and azotic gas, and their instantaneous disengagement, caused by friction or heat, that the violent detonation of this powder is to be attributed. The mercurial preparation called *Fulminating Mercury*, which detonates when mixed with sulphur, was first discovered by Mr. Bayen.—*Fulminating silver* is produced by dissolving fine silver in pale nitric acid, and precipitating the solution by lime water. After decanting the fluid, mix the precipitate with liquid ammonia, and stir it till it assumes a black colour; then decant the fluid, and leave it in the air to dry. This compound is most dangerously explosive.

FUNERALS. [CEMETERIES, *Suppl.*]

FUNGIA (Lat. *fungus* a mushroom), a genus of the Madrepore corals, of the family *Corticati*.

FUNGIC'OLÆ (Lat. *fungus* a mushroom, and *colo* to inhabit), a family of coleopterous insects, with oval body, and the antennæ longer than the head and thorax combined.

FURCA (Lat. a *fork*), among the Romans, an implement of punishment, consisting of a strong piece of wood resembling a fork, whence it derived its name. There were different kinds of punishment; as the *furca ignominiosa*, when a servant, by way of disgrace, was obliged publicly to carry the furca on his shoulders;—the *furca pœnalis*, when a criminal was obliged to carry the furca about his neck, and receive a public whipping;—and *furca capitalis*, which was inflicted for a capital felony, when the malefactor was whipped to death, with the furca fastened about his neck. In the feudal age the furca was in some measure retained, under different modifications, as an implement of punishment. Thus *Furca et Fossa* was a privilege granted by our kings, of summarily punishing felons by hanging or drowning,—men by the former, and women by the latter mode. *Furca et Flagellus* was a kind of feudal subjection, according to which the bondmen were at the disposal of their lord for life or limb.

FURLOUGH, leave of absence granted to soldiers, either periodically, or upon extraordinary occasions, to enable them to visit their friends, or recruit their strength in cases of ill health. The furlough of an officer in the royal service is called 'leave of absence.' Officers in the East India Company's service are allowed one year's leave to England on their private affairs, at any time without pay; but if absent on account of sickness, they receive the whole of their pay and allowances during that period.

FUSIBLE BASES. The substances in nature, which at present are considered as elementary, amount to about sixty; although, perhaps, it may be found, with the progress of chemical science, that many substances, at present set down as elementary, may be mere compounds of other bodies. These primary elements of matter have been arranged under three great classes,—1st, the Supporters of Combustion; 2nd, the Acidifiable Bases; and 3rd, the Alkalifiable Bases. Of these, the alkalifiable bases are the most numerous

and important; being divided into the Alkaline Bases, the Earthy Bases, the *Fusible Bases*, and the Noble Metals. The fusible bases are divided into those which are *difficultly fusible*, as iron, manganese, nickel, and cobalt; and those which are *easily fusible*, as zinc, cadmium, lead, tin, bismuth, copper, and mercury, which are each explained under their respective heads.

FUSILI'ERS, soldiers in the British service, whose muskets are lighter and shorter than those of the battalion and grenadiers, and more suited for rapid and desultory firing. There being no ensigns in fusilier regiments, the junior officers rank as second lieutenants.

FU'SINÆ (Lat. *fusus* a spindle), a sub-family of Mollusca, of the family *Turbinellidæ*, commonly called Spindle shells, from their slender and fusiform shape.

FUST, RIGHT HON. SIR HERBERT JENNER, Dean of the Arches, and Judge of the Prerogative Court of Canterbury, was born in 1783. He was educated at the University of Cambridge, and graduated as LL.D. in 1803. He was called to the bar in 1800, and admitted an Advocate to the Ecclesiastical and Admiralty Courts in 1803. In 1828 he was appointed King's Advocate-general, and received the honour of Knighthood. In 1832 the Archbishop of Canterbury appointed him his Vicar-general. But these latter offices he resigned, in 1834, on being promoted to be Official Principal of the Arches, and Judge of the Prerogative Court of Canterbury, which high offices he held to the time of his death, and discharged the duties thereof with distinguished ability and learning. He died in 1852.

G.

GAB'RONITE, a mineral of bluish colour, found in Norway; the specific gravity nearly 3·0. Its component parts are silica, 54·0; alumina, 24·0; magnesia, 1·5; soda and potash, 17·25; protoxide of iron and manganese, 1·25; water, 2.

GAD'OLINITE, a mineral of an iron-black colour, found in oblique rhombic prisms, and so called in honour of M. Gadolin, the discoverer. Its specific gravity is 4·2; but the analysis of its component parts have not been determined with any certainty. According to Dr. Thomson they consist of yttria, 45·00; glucina, 11·60; protoxide of cerium, 4·33; protoxide of iron, 13·59; silica, 24·33.

GAINAGE, a word mentioned in Magna Charta, c. 14, meaning the plough-tackle, or implements of industry, which term, in the feudal age, was applied to the *gain* or profit of tilled or cultivated land, of which an estimate was taken by the lord.

GAIANITES, an early sect of Christians, who flourished in the sixth century, and received their appellation from Gaian, Bishop of Alexandria. They were a branch of the Eutychians, and maintained that Christ was not subject to any human infirmities.

GAISFORD, VERY REV. DR. THOMAS, Dean of Christ Church, Oxford, and eminent in classical literature, was born at Iford, in Wiltshire, in 1779. He was educated at Winchester; and, after having passed through the usual degrees at Oxford, in 1809–1810 he filled the office of public examiner. In 1811 he was appointed Regius Professor of Greek; and in 1831 he became Dean of Christ Church. As Greek professor, Dr. Gaisford was an official curator of the Bodleian Library; and for a period of nearly fifty years he filled the office of delegate of the press with remarkable care and ability. He was editor of a vast number of classical works, which will not fail to transmit his name to posterity; among others may be mentioned his great lexicon of Suidas; his 'Etymologicon Magnum;' the 'Electra' and 'Alcestis' of Euripides; 'Cicero de Oratore;' 'Poetæ Græci Minores;' 'Homeri Ilias;' 'Herodotus, cum Annotationibus Variorum;' 'Suidæ Lexicon;' the works of Eusebius, &c.; all of which, though not of a popular character, are held in high estimation by classical students and scholars. He died in 1855; and, soon after his death, it was resolved, at a meeting held in Christ Church, to found a Greek prize, to be called the 'Gaisford Prize,' in memory of the late dean; for which purpose a subscription of not less than 1000*l.* was to be raised, and the interest employed in rewarding successful prizemen.

GALAC'TIA (Gr. γάλα milk), a genus of leguminous plants, so called from yielding a milky juice when cut or broken. It consists of climbing shrubs or herbs, and is of the sub-order *Papilionaceæ*.—*Galactites* is the name of a genus of composite milk-leaved plants, of the sub-order *Tubuliflorœ*.

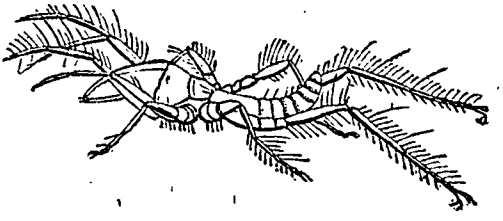
GALACTODEN'DRON, the Cowtree, so called from its yielding large quantities of nutritious vegetable milk.

GALAXAU'RA (Gr. γαλαξίας milky, and οὐρὰ a tail), a genus of corals, of the family *Cellularii*.

GALAX'IAS (Gr. γαλαξίας the milky way), a genus of fishes, of the family *Salmonidæ*.

GALEO'DES (Lat. *galea* a crest), a genus of *Arachnides*, of the family *Solpugidæ*, and sub-family *Scorpiones*. The family of the *Solpugidæ* includes several spider-like animals, some of which are of a dangerous character. The common species, the *Galeodes intrepida*, or *arenoides*, live principally in the sandy deserts of the old world, and attain the length of about two inches. The antennal jaws and palpi are

very large; the latter being longer than the three anterior pairs of legs. They are thus described by Cuvier, in his 'Règne Animal:' 'The body is oblong, generally soft, and clothed with long bristles; the knob at the tip of the palpi incloses a peculiar organ, which is only protruded when the animal is irritated; the two forelegs may be considered as a second pair of palpi.' These animals run with great swiftness, and are very voracious, sometimes attacking lizards and even birds. When threatened, they retreat with their nippers raised in an attitude of defiance. It is said that they are a great pest to camels when traversing the desert, and that they are extremely venomous.



THE GALEODES INTREPIDA.

This formidable species of *Arachnida* was familiar to the ancients, and designated by the names of Solifuga, Phalangium, Tetragnatha, &c. M. Poë discovered a species near Havannah; but the genus is peculiar to the warm and sandy countries of the old world.

GALEOPITH'ECUS (Gr. γαλῆ a weasel, and πίθηκος a monkey), the flying Lemur, a genus of carnivorous Mammalia, of the family *Cheiroptera*.

GALERI'TA (Lat. *galeritus* wearing a cap), a genus of coleopterous insects, belonging to the family *Carabidæ*.

GAL'ERITES (Lat. *galerus* a cap), a genus of fossil Echini, of a sub-pyramidal or conoidal form.

GALERU'CIDÆ (Lat. *galerus* a tuft or cap), a genus of coleopterous insects, of which the *Galeruca* is the type.

GA'LEUS, a genus of fishes, of the family *Squalidæ*, or Sharks.

GALILE'ANS, an ancient Jewish sect, which received its name from Judas, the Galilean. They were distinguished for their opposition to the Roman tax established by Quirinus; and they carried on a kind of civil war, which continued with more or less opposition till the destruction of Jerusalem by the Romans.

GALLE'RIA (Lat. *gallus* a cock), a genus of lepidopterous insects, of the family *Nocturna*.

GALLI, priests of the goddess Cybele, so called from the river Gallus, in Phrygia, of which they were in the habit of drinking before they began their festivals, because it was supposed that the water of that river infused the divine madness which accompanied their sacrifices. They were also called Corybantes, who, in the celebration of their orgies, beat their cymbals, and acted as if they were delirious:—

'Et resupinati cessantia tympana Galli.'

GALVANIZED-IRON, a name given to plates of iron, tinned by a very simple process, which has been lately patented, and is sometimes called *Galvanized Iron-tin*. In its preparation the plates, or sheets of iron, are first dipped into melted zinc, and then into melted tin. Thus, from the galvanic action of those two metals combined, they become capable of resisting oxidation when exposed to moisture; the plates being, in reality, a combination of three metals. This material is manufactured into a variety of articles, and is of very general use in the arts; being more durable and stronger than zinc or lead, and much better than plain iron, when rust is to be avoided. From these galvanized plates, buildings of various kinds, from the humble cabin to a stately church or council-hall, have been constructed, for exportation to our Australian and New Zealand colonies. The various plates are duly numbered, and closely packed for their destination, and in a very few days, after their arrival, they assume the shape of comfortable domiciles, or commodious public edifices. But the utility of this material is not confined to the external parts of buildings. It is adopted for various kinds of vessels and household utensils. We have (says the editor of 'Novelties and Inventions') galvanized tinned iron corrugated plates for roofing, and for the sides and doors of houses. In another form there are plain plates for roofing, and for the sides and doors of houses; roofs for sheds, roofs and sides for store-houses, and many similar purposes. Then, beside the sheet form, there are round and square bars, hoop iron, wire, tubes and pipes, nails, rivets, bolts, screws, all formed of iron thus protected by the galvano-tin process. There is this advantage also, which is unattainable by the ordinary tin-plate process, that articles can be tinned after they are made in the proper form of iron, provided they are of small dimensions.

GALWAY, County of (vi. 499–503). According to the census of 1851, the population of the county was 298,129. Of inhabited houses there were 49,302. The population of the principal places was as follows:—

Athenry	4,505	Gort	5,042
Ballinasloe	6,550	Headford	1,195
Clifden	2,252	Loughrea	7,240
Clonfert	3,884	Portumna	1,689
Eyrecourt	936	Tuam	13,060
Galway	23,695		

GAMBIR EXTRACT (Malay), a preparation from the leaves of the plant *Uncaria gambir*, which is chewed by the natives, mixed with areca

and betel nut; and the use of it is said to be rapidly extending throughout India and the islands of the Archipelago. The *Nauclea gambir* is a shrubby plant, very extensively cultivated, which grows about six or seven feet high. The leaves, on being well boiled, yield the gambir extract, which being poured into moulds hardens for use. The extract has a sweetish taste, and possesses a pleasant aromatic flavour. The most esteemed samples are from Penang and the coast of Bengal, which places produce upwards of ten million pounds annually. The imports into our country, within the last few years, have averaged 6000 tons per annum.

GAMES. Among the ancient Greeks and Romans, public games and combats appear to have formed a most important part of the national and religious festivals. The four principal games publicly solemnized in Greece, and frequently mentioned by historians and poets, were the *Isthmian*, the *Olympic*, the *Pythian*, and the *Nemæan*, which are each described under their respective heads. Among the early Romans the public games were of different kinds at different eras of the republic. The most celebrated, however, were the *Ludi Circenses*, or games of the Circus, consisting of chariot and horse-races. The ordinary games were of two kinds, the sacred and the honorary. The former consisted of the Ludi Augustales, Apollinares, Capitolini, Consuales, Cereales, Florales, Martiales, Seculares, &c.; and the latter, which were of a votive or complimentary nature, comprehended the Ludi Magni, Quinquennales, Decennales, Triumphales, Natalitii, Miscelli, combats of gladiators, scenic games, and other theatrical sports. There were likewise the funeral games, consisting of all the exercises of the Pentathlum. Under the Emperors there were many places called *Gymnasia*, where the Romans were accustomed to exercise their bodies by various games before bathing. These exercises consisted chiefly of throwing the javelin, the ball, or the quoit, leaping, running, riding, &c.

GAR'ANCINE, a dyeing powder prepared in France from madder root. Its discovery arose from the observed action of sulphuric acid upon vegetable substances allied to sugar, which not only introduced the new art of making garancine, but many other important improvements in the old art of dyeing.

GARROTE', a Spanish mode of inflicting the punishment of death by means of a collar tightly screwed round the neck, while the criminal is fastened to an upright board to which the collar is attached. The term is also applied in this country to the modes of strangulation, adopted by thieves and footpads, for the purposes of robbing.

GARRULI'NÆ (Lat. *garrulus* chattering), a sub-family of the *Corvidæ*, or Crows, of which the *Garrulus*, or Jay, is the type.

GAS (vi. 539–43). In 1848 it was estimated that there were 500,000 tons of coal consumed in London for the manufacture of gas; but, according to recent returns, there are, at the present time (1858), 840,000 tons of coal annually consumed in the process, thus yielding 7,728,000,000 cubic feet of gas, which, at 4*s*. 6*d*. per 1000 feet, would realize a gross income of 1,738,000*l*. per annum. It is stated that nearly 2,000,000*l*. are annually paid to the various gas companies of the metropolis. Yet with all this vast consumption of gas, that of oil has not diminished, or its price been reduced.

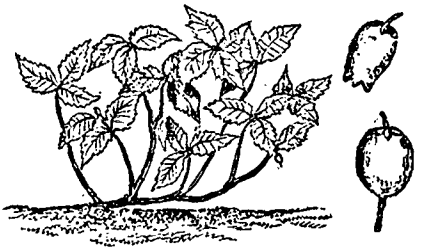
At the present time (1858) the quantity of pit coal carbonized for the supply of England, Wales, and Scotland with illuminating gas may be fairly estimated at 3,510,000 tons per annum, which at an average ascertained cost of 10*s*. 8*d*. per ton, amounts to the sum of 1,872,000*l*.

GASTEROPEL'ICUS (Gr. γαστὴρ the belly, and πηλίκος how large), a genus of fishes belonging to the family *Salmonidæ*, or Salmon.

GAS'TEROPLAX (Gr. γαστὴρ, and πλὰξ flat), a genus of gasteropod Mollusca, with a large and circular body, and carrying a stony shell.

[It may here be observed that the word *Gaster*, denoting the belly or stomach, is extensively used as a compound in the formation of numerous scientific words connected with zoology, physiology, botany, &c. Thus *Gasteröpteron* (wing-bellied), in zoology, is a genus of Mollusca, with wing-like lobes on the belly;—*Gasterosteus*, a genus of fishes, with spiny fins, belonging to the family Zeida.—*Gastrocephalitis*, in pathology, is inflammation of the stomach and the membranes of the brain;—*Gastro-colic*, inflammation of the stomach and the colon;—*Gastro-dermitis*, irritation of the stomach and skin;—*Gastro-hepatis*, inflammation of the stomach and liver; *Gastro-splenitis*, gastric irritation with painful tumefaction of the spleen;—*Gastro-thalameæ*, in botany, is a tribe of Lichens, in which the thalamus, or shield, is always closed or opened by the irregular separation of the thalladial covering;—*Gastrolobium* (lobe-bellied), is a genus of leguminous plants, of the order Papilionaceæ;—*Gastromeria*, a genus of shrubby plants, of the order *Scrophulariaceæ*; with numerous other similar compounds.]

GAULTHE'RIA (from *M. Gaulthier*, the Canadian botanist), a genus of shrubby plants, of the order *Ericaceæ*, which produces very pretty rose-coloured or scarlet corollas. The succulent fruits of the *G. procumbens* and *G. shallon* of North America are very odoriferous, and sometimes used for food.



GAULTHERIA PROCUMBENS.

Johnston, in his 'Chemistry of Common Life,' when treating of the 'odours we enjoy,' mentions that in the State of New Jersey, N. A., the partridge berry, tea-berry, or winter green (*Gaultheria*

procumbens) grows abundantly in the woods and drier swamps. It is a dwarf evergreen fragrant heath plant, and possesses an agreeable aromatic odour resembling that of the sweet birch. It has long been gathered and distilled, like other fragrant plants, for the sake of the volatile oil, which in this way may be extracted from it. This natural essence is largely imported into Europe as a perfume, and is known in commerce by the name of 'oil of winter green.'

GAVEL (Sax. *gafel*), among our Anglo-Saxon ancestors, a tribute toll, or yearly rental, of which there were various kinds; as *gavel-corn, gavel-fodder, gavel-malt,* which implied that tribute was to be paid to the lord in those particular commodities (Cowel).—*Gavelet* was an ancient and special kind of legal cessavit, customary in Kent, by which the tenant should forfeit his lands and tenements, if he withheld the rent and services due to the lord from whom he held.

GAY-LUSSAC, a distinguished chemist and philosopher, Peer of France, and Professor of Chemistry at the Polytechnic School, was born at St. Leonard, in France, in 1778; and it may be truly said that the important discoveries he has made in physical science have immortalized his name. The numerous experiments he made, in co-operation with Humboldt, Berthollet, Biot, Renard, and others, connected with the general laws that regulate the composition of bodies, have proved of the greatest practical utility to mankind. At a very early age he distinguished himself by his aerial voyages, undertaken for the purpose of making scientific observations on atmospheric phenomena at great heights. In 1804 he ascended in a balloon from Paris, with M. Biot, to the height of 13,000 feet; and during the same year he ventured alone, and ascended 23,000 feet. He died in 1850, after a life of indefatigable industry in the pursuit of science. The mineral *Gay-lussite,* which occurs in imbedded crystals, was so named in his honour.

GAZONS, in fortification, pieces of fresh earth or sods for lining the outsides of a work made of earth, as parapets, banquettes, or ramparts. They are about a foot long, and half a foot thick, and cut in the shape of a wedge.

GEAGH, a Turkish chronological cycle of twelve years; each year being characterized by a different animal, viz. the mouse, bullock, lynx, hare, crocodile, serpent, horse, sheep, monkey, hen, dog, and hog. Each day is subdivided into twelve geaghs, which is also denoted by the name of some animal. (Craig.)

GEDDES, ANDREW, A.R.A., an accomplished artist, was born at Edinburgh in 1789. He received his education at the High School, and was afterwards removed to the University. Early in life he evinced a great predilection for painting and the arts connected therewith; and he had the good fortune to receive the patronage and assistance of Lord Eldon. Among the most characteristic of his works were portraits of his friend and fellow-student Wilkie (now in the possession of Lord Camperdown); of Henry Mackenzie (the 'Man of Feeling'); and of Dr. Chalmers. His portrait of the Duke of York was pronounced by George IV. to be the very best likeness ever painted of that prince. In 1832 he was elected a member of the Royal Academy. During his latter years his works were fresh in the public mind; and the fulness of his artistic powers, in the highest works of art, was evinced in his altar-piece painted for the church of St. James, Garlick Hill; and in his picture of 'Christ and the Woman of Samaria.' He died in 1844.

G-FLAT, in music, is the flat seventh of A flat; the fifth flat introduced in modulating by fourths from the natural diatonic mode. *G Gamut* is the first G below the bass-cliff note. Guido was the first who added this note to the ancient scale, and applied to it the Greek letter *Gamma.* (Busby.)

GEHEN'NA (Gr. γέεννα a place of future punishment; Heb. *Gehinnom* the valley of Hinnom), a term used by the Evangelists and the Jews as equivalent to hell, and probably for the following reason. At the head of the river Siloa, near Jerusalem, in a pleasant grove, there was an image of Baal erected at the foot of Mount Moriah, to whom the backsliding Jews were in the habit of sacrificing, and making burnt offerings. Hence the place was called *Gehenna,* or a place for the wicked. 'It is thought,' says Calmet, 'to have been the common sewer belonging to Jerusalem, and that a fire was always burning there to consume the filth of the city. In allusion to this circumstance, or to the fire kept up in the valley, in honour of Moloch, the false god, to whom the Hebrews frequently offered human sacrifices, and even their own children (Jer. vii. 31), hell is called Gehenna in some parts of the New Testament.' [HADES, *Supplt.*]

GELATINE OF FOSSIL BONES. [BONES, FOSSIL, *Supplt.*]

GEL'ATINE CASTS. [PAPIER GLACÉ.].

GELD (Sax. *gild,* or Dan. *gield,* tribute money), a term used by our Anglo-Saxon ancestors to signify money or tribute, being a fine or compensation for a public wrong. Thus *Wergeld* was compensation for a man's life; and *Oxgeld* the value of a beast slain. *Angeld* was the single value of a thing; and *Twigeld,* the double value. *Danegeld* was the name of a tax imposed by the Danes.

GEN, a species of manna collected from the branches of the *Hedysarum alhagi,* or camel's thorn, which grows plentifully in Arabia, Persia, Syria, Bokhara, and other eastern countries. Extensive plains are covered with this plant, and it is highly esteemed as food for camels, goats, and sheep. From the browsing of these animals the manna chiefly exudes. The Arabs of the travelling caravans use it for food when crossing the desert.

GENOUILLERE (Fr. *genou* the knee), that part of the parapet of a battery which remains above the platform, and under the gun, after the opening of the embrasure has been made. Its height is generally from two to three feet, according to the height of the gun carriage.

GENTILE, a name given by the Hebrews to all those who were not of their religion; and they generally applied the term to an idolator, or

worshipper of strange gods. In the writings of St. Paul the Gentiles are commonly called Greeks; and he is usually called the apostle of the Gentiles, or Greeks, because he principally preached Christ to them; whereas Peter, and the other apostles, preached generally to the Jews, and were designated as apostles of the Circumcision. Those who were converted, and embraced Judaism, were called Proselytes. Among the Romans, the term was applied to any foreigner or person not subject to the laws of Rome.

GENTLEMEN-AT-ARMS, the body-guard of the sovereign, who attend on state occasions. They consist of a captain, lieutenant, standard-bearer, clerk of the cheque, forty gentlemen-at-arms, and the harbinger. The corps was first instituted by Henry VIII., and composed only of gentlemen of noble blood. It then received the appellation of Gentlemen Pensioners; but in 1834 the name was changed to that of Gentlemen-at-Arms. The pay of the captain is 1000*l.* a year; the lieutenant, 500*l.*; the standard-bearer, 310*l.*; the forty gentlemen-at-arms, 100*l.* each; the clerk of the cheque, 120*l.*; and the harbinger, 70*l.*; making a total of 6000*l.*

GE'OMANCY, among the ancients, a kind of divination, which Polydore Vergil describes as being performed by means of clefts or chinks made in the ground, and first invented by the Persian Magi. The Greeks performed the ceremony of geomancy by means of a number of little points, or dots, made on paper at random. According to the different lines and figures presented by those points, they formed a judgment of futurity, and decided any question proposed.

GEOM'ITRA (Gr. γὴ land, and μίτρα a band), a genus of Mollusca, of the family *Helicidæ*, and belonging to the *Helicinæ*, or common land-snails, the shell of which is thick, conical, and obtuse, the whorls being striated and croonated with tubercles.

GEORY'CHUS (Gr. γὴ, and ὄρχυς digging) genus of quadrupeds (the Lemmings), of the order *Rodentia*, and allied to the rat and mouse, with toes formed for digging.

GEOSIT'TA, a genus of birds, of the family *Cerathiadæ*, and belonging to the *Sittinæ*, or Nuthatches.

GEOTROCH'US (Gr. γὴ, and τρόχος a boy's top), a genus of Mollusca, the shell of which is trochiform, and the body-whorl more or less carinated.

GE'OTRUPE (Gr. γὴ, and τρυπάω a borer), a genus of coleopterous insects, of the family *Scarabeidæ*.

GEOV'ULA (Gr. γὴ, and Lat. *ovum* an egg), a genus of Mollusca, of the family *Turbidæ*, with an oval shell, and very short turbinated spire.

GERRHA (Gr. γερρὸν a Persian shield), among the Greeks a kind of hurdle or shield covered with wicker-work, which the soldiers in sieges held over their heads, to protect themselves from beams or falling stones. They resembled the *vineæ* of the Romans.—*Gerrhophoroi* was the term applied to the soldiers who carried these shields.

GILBERT, DAVIES, Vice-President of the Royal Society, and of the Geological Society of Cornwall, D.C.L., F.S.A., F.L.S., F.G.S., &c., was born at St. Erth, in Cornwall, in 1767, and descended from a very ancient family of that county. After the usual routine of a liberal education, he proceeded to Oxford, and in 1789 received the degree of Master of Arts. In 1791 he was elected a Fellow of the Royal Society, and afterwards became a member of most of the learned societies of the day. In 1792 he served the office of high sheriff of the county of Cornwall. In 1804 he was elected M.P. for the borough of Helston, and in 1806 was returned for Bodmin, which place he continued to represent till 1832. He was a most assiduous attendant on his parliamentary duties, and took a prominent part in all investigations connected with the arts and sciences. On his marriage with the only daughter and heiress of Thomas Gilbert, Esq., of Eastbourne, in Sussex, he sank his family name of Giddy, and took the name and arms of Gilbert. From this period he resided at Eastbourne, when absent from parliamentary duties. On the retirement of his friend, Sir Humphry Davy, from the presidency of the Royal Society, in 1828, Mr. Gilbert was chosen president, to the great satisfaction of that scientific body. In 1831 he retired from the presidency of the society, to make room for the Duke of Sussex; but he still continued to act as vice-president, and occasionally to preside at the meetings of the society. In 1832 he received the diploma of Doctor in Civil Law from the University of Oxford.

As President of the Royal Society the duty devolved upon Mr. Gilbert of selecting eight different persons—the most eminent in literature and science—to write the Bridgewater Treatises 'On the Power, Wisdom, and Goodness of God, as manifested in the Creation.' In his selection the highest judgment was exhibited, and it gave general satisfaction to the scientific world. Dr. Buckland was chosen for the treatise on 'Geology and Mineralogy considered with reference to Natural Theology;' and in dedicating the work to Mr. Gilbert, in 1836, he thus writes:—'Whatever other results may have attended my public exertions, I assure you that it is a source of much satisfaction to me, to find them thus rewarded by the approbation of a philosopher, whose attainments placed him in the chair once occupied by Newton, and who is endeared by his urbanity to all who have ever enjoyed the happiness of communicating with him, either as President of the Royal Society of London, or that more familiar intercourse of private friendship to which it has been my privilege to be admitted.'

Amidst his various avocations Mr. Gilbert did not fail to devote himself occasionally to the interests of general literature. To the Philosophical Transactions he communicated an elaborate paper on the Catenary Curve, accompanied by extensive tables for constructing the Menai bridge; a second, on Steam-engines; and a third, on the nature of Imaginary Curves. He also contributed various papers to the Journal of the Royal Institution, and one of considerable length on the vibration of pendulums. In 1813 he communicated to the Society of Antiquaries a

very interesting account of the opening of a burrow at Berling, near Eastbourne, which was printed in the 17th volume of the 'Archæologia.' In 1823 he edited 'A Collection of Ancient Carols, with the Tunes to which they were formerly sung in the West of England.' In 1826 he brought out 'Mount Calvary; written in Cornish, and interpreted in the English tongue by John Keigwin.' In 1827 appeared, under his editorship, 'The Creation of the World, with Noah's flood, written in Cornish in 1611, by Wm. Jordan, and translated by John Keigwin.' In 1830 he contributed to a volume of plates representing the newly-repaired windows of St. Neot's Church, some valuable collections and traditions respecting the patron Saint, St. Neot. The last and most important of his topographical works was his edition of Hals' 'History of Cornwall,' published in 4 vols. 8vo. (1838). To every parish Mr. Gilbert added some valuable information relative to the family history and biography of the most eminent Cornish men, and more especially of his contemporaries. He died at Eastbourne, in Sussex, in 1840.

GIL'BERTITE, a mineral, of a white and yellow-tinged colour, composed of plates lying irregularly on each other. It consists chiefly of silica and alumina, and its specific gravity is 2·648. It was so called by Dr. Thomson, in honour of Davies Gilbert, President of the Royal Society.

GILLESPIE, REV. DR. T., Professor of Humanity in the University of St. Andrews distinguished for his many beautiful contributions to the literature of his country, was formerly minister of Cults, in the Presbytery of Cupar; but having been appointed assistant and successor to his father-in-law, Dr. John Hunter, Professor of Humanity in St. Andrews, he vacated the living of Cults, and settled in the city of St. Andrews, where he long distinguished himself in the classical world as an author and a teacher. There is a vast amount of his writings, both prose and verse, still extant in the newspaper press of Scotland, as well as in the magazines of the day. He died in 1844.

GINGALS, or GINGAULS, large muskets used in India by the natives, generally with a rest and matchlock; but they are very cumbersome when compared with the modern rifle.

GISBORNE, REV. THOMAS, Prebendary of Durham, distinguished as a theological, philosophical, and poetical writer, was born at Derby, in 1758. He was educated at Harrow and Cambridge; and having entered holy orders in 1792, he obtained the living of Barton, in Stafford. He was not only an exemplary clergyman, but devoted all his spare time to the pursuits of literature; and many of his works have obtained a lasting and deserved popularity; among others may be enumerated his 'Principles of Moral Philosophy investigated;' 'An Inquiry into the Duties of the Fair Sex;' 'A Familiar Survey of the Christian Religion and History;' and two volumes of poetry, entitled 'Walks in a Forest;' and 'Poems, Sacred and Moral.' He died in 1846.

GIS'MONDINE (so called in honour of the mineralogist Gismondi), a mineral occurring in white translucent crystals, at Capo de Bovo, near Rome. It consists chiefly of silica and lime; its specific gravity being 2·16.

GLABEL'LA (Lat. *glabellus* smooth), a genus of Mollusca, of the family *Volutidæ*, with a volutiform shell, and spire more or less conical.

GLADIO'LUS (Lat. *gladius* a sword, from its spear-shaped leaves), a genus of plants (the Corn-flag), of the order *Iridaceæ*, some of the species of which are conspicuous for their floral beauty.

GLAIRINE (Fr. *glaire*, the white of an egg, or any viscous substance), a remarkable animal substance, found in several European springs, which is supposed to be derived from certain strata containing animal fossil remains, through which the water percolates.

GLAMORGANSHIRE (vi. 698–703). According to the census of 1851, the population of the county was 231,849. Of houses, inhabited and uninhabited, there were 43,202. The area of the county was 856 square miles, or 547,494 acres. The population of the principal places was as follows:—

Aberavon	pa.	2,380	Loughor	pa.	1,099
———	bor.	6,567	———	bor.	821
Aberdare	pa.	14,999	Merthyr-Tydvil	t.	46,387
Bridgend		1,500	———	bor.	63,080
Cardiff		18,351	Neath	t.	5,778
Cowbridge		1,066	———	bor.	5,841
Llandaff		1,821	Swansea	t.	24,902
Llantrisaint	pa.	4,181	———	bor.	31,461
———	bor.	1,007			

GLAPHYRIA (Gr. γλαφυρὸς elegant), a genus of small Indian trees, of the order *Myrtaceæ*.

GLAPHYRIDÆ, a genus of coleopterous insects (the Wasp-beetles), distinguished by their hairiness, and the shortness of their elytra.

GLASGOW (vi. 705–7). Within the last ten years the city of Glasgow has been making rapid advances. In local and commercial enterprize, population, railways, and general wealth, she has been wonderfully progressive. The vast improvements effected in the navigation of the Clyde, with its docks and harbours, within a few years, may be classed among the wonders of the age. At a recent meeting of the British Association at Dublin, Dr. Strang, in a paper on the advantages arising from the 'Improvement of Tidal Rivers,' cited the Clyde as an example, which, in 1768, had only a depth of two feet of water; but at the present time, by engineering skill and labour, had been rendered navigable for vessels drawing twenty feet of water. Hence, in consequence, the number of vessels annually arriving had increased, from 11,505 in 1828, to 17,960 in 1857; the tonnage having extended from 696,261 to 1,612,681. Thirty years ago there was not a steamer on the Clyde of more than 100 tons; but at the present time vessels of 3000 tons can enter. The costs of these improvements have, of course, been very large. From 1770 to 1568 an expenditure of 2,527,199*l.* was incurred. In 1791 the annual revenue amounted to 1046*l.*,

while, in 1856, it has increased to 82,797*l.* The advantages resulting from the improvement of the Clyde, and the commercial spirit of the inhabitants, may be thus enumerated. Formerly Glasgow had comparatively little trade; but in 1854, the value of exports had increased to 4,905,557*l.*; registered ships to 568, with an aggregate of 204,331 tons; ship-building yards were thirty, which produced, in 1833-4, 266 vessels, at a cost of five millions of money. In 1796 the customs of Glasgow were only 125*l.*; while, in 1856, they amounted to 718,855*l.*; and the taxes of Glasgow, which a few years since were very trifling, had swelled to 2,800,000*l.*, with an annual rental of 1,319,720*l.* Not many years ago, the population of Glasgow was 24,000; but, according to the last census, it was 345,145; and the present population may be estimated at 420,000. In 1857 the revenue of the post-office, which some years ago was very insignificant, had increased to 64,958*l.*

GLASS, (vi. 707–710). Since the abolition of the duty on glass, in 1846, this useful material has been applied to various purposes, owing, no doubt, to its comparative cheapness. Of this, the great Exhibition of 1851 afforded a splendid example; and the Crystal Palace at Sydenham is a standing memorial of Sir R. Peel's wisdom in repealing the obnoxious tax. Immense roofs and windows are now everywhere constructed for manufacturing social objects, of which our forefathers would never have dreamt. Even the floors of buildings are frequently inlaid with large plates of thick glass, for the purpose of throwing light into basement rooms, where previously none could enter; and these plates are so strong, that an ordinary truck may be wheeled over them with safety. Rough plate or bottle glass, intended for floors, is made from a quarter of an inch to an inch and a half in thickness; and some of these specimens are so strong, that in the streets of London they are walked over by thousands of pedestrians in situations where it is necessary to throw light into an underground kitchen or cellar. Glass tiles, shelves, and implements of every description are also manufactured at a cheap rate. 'Glass tiles,' says the editor of 'Novelties, Inventions, &c.,' 'are made of rough plate from one-eighth to one-half of an inch in thickness, and of sheet glass from sixteen to thirty-two ounces per square foot; and glass-slates, drilled with holes for fixing, are made of similar materials. Glass shelves, with or without raised edges, and from two to six inches in width, are sold by the foot. For immediate horticultural or daily use, we find bee-glasses, propagating-glasses, cucumber-glasses, wall-fruit glasses, fruit-protecting glasses, peach and grape glasses, fern-shades, milk-trays and pans, cream-pots, and numerous other articles.'

It is well known that silica, soda, potash, lime, and oxide of lead, are nearly the sum total of the elements of which glass is made. Formerly the soda required in manufacturing operations was chiefly obtained from the ashes of burnt plants, such as Carilla and Kelp; but when the heavy excise duty on common salt was removed, in 1825, this article, from its great abundance, soon became the source from which soda could be obtained, not only for the manufacture of glass, but for many other practical purposes; thus demonstrating the great evils attending excessive taxation, when imposed on the necessary articles of life. We have now only to take up the list of prices issued by some of our London manufacturers of glass articles, and we shall have ample proofs of their reduced prices, as well as their variety. Thus we find patent rough plate-glass, one-eighth of an inch thick, obtainable in sheets up to a size of ten or twelve superficial feet, for sky-lights and conservatories, and saleable, whether large or small, at 8*d.* to 10*d.* per foot. The sheet-glass for conservatories is made so rough as to obviate the scorching effects of the sun's rays. The more extended and general use of plate-glass, for the adornment of the windows of our dwelling-houses, is another important feature attending the reduction of duty. Such was formerly the high price of large plates of glass for mirrors, windows, &c., that they were confined almost exclusively to wealthy establishments, or to the domiciles of the rich. But now, they may be seen in the habitations of the humblest tradesmen in every part of the British Empire. Since the remission of the duty on glass there have also been great improvements in the glasses used for optical and telescopic purposes. Previous to the year 1845, the English glassmakers were almost entirely prevented from competing with continental artists. Fraunhofer, of Munich, Guinand, his pupil, and Bontemps, the successor of Guinand, have acquired a world-wide reputation, especially for their skill in that which is a work of extreme difficulty, the construction of lenses for large telescopes, while the efforts of our native manufacturers were paralyzed by an onerous tax on the material of this art. Until recently the dioptric lenses for lighthouses, on the principle laid down by Brewster and Fresnel, were principally manufactured on the Continent; but at this time our own English makers are able to enter into honourable competition with foreigners. At a late meeting of the British Scientific Association at Ipswich, the Astronomer Royal communicated the following gratifying details, in connection with the progress of the art in the manufacture of optical instruments:—'The removal,' said he, 'of the vexatious fiscal interference with the manufacture of glass, and the enterprize with which Mr. Chance, as manufacturer, and Mr. Simms and Mr. Ross, as opticians, have taken up the construction of long object-glasses, promise to lead to the most gratifying results. Already Mr. Simms has partially tested object-glasses of thirteen inches aperture; and one of sixteen inches is waiting, not for the flint, but for the crown lens. Mr. Ross, it is understood, has ground an object-glass of two feet aperture. The facility of procuring large object-glasses will undoubtedly lead to the extensive construction of graduated instruments on a larger scale than before.'

That beautifully coloured and highly ornamented glass, specimens of which have been only recently manufactured in this country, was the staple manufacture of Venice during the sixteenth

and seventeenth centuries. For the revival of this ingenious art we are, in a great measure, indebted to Mr. Pellatt, of the Falcon Glass Works, in London. In a work published by him, entitled the 'Curiosities of Glassmaking,' he tells us that the *frosted* glass was formerly known and practised only by the Venetians, until revived by him at his own glass-works. He says that it is produced 'by plunging the white hot glass into cold water, and then re-heating and re-blowing it; although it appears covered with fractures, this glass is perfectly sonorous.' In the work just cited, Mr. Pellatt mentions various kinds of glass ornamentation practised by the Venetians, and which are now being partially revived in this country. Among others he notices the 'Venetian filagree,' the 'Millefiore glass,' the 'Mosaic glass,' &c. The first consists of spirally-twisted plain and coloured enamel glass, which is much used for the stems of goblets, glasses, &c. The 'Millefiore glass' consists of a great variety of ends of fancy-coloured tubes, cut sectionally at right angles with the filagree cane to form small lozenges or tablets; and these, when placed side by side, and massed together by transparent glass, have the appearance of an innumerable series of flowers or rosettes for ornamental vases, &c.—*Mosaic glass* was produced by threads or small cones of variously-coloured opaque or transparent glass, of uniform lengths, ranged sectionally together in groups; so that the ends may form grounds on which are patterns of flowers, or arabesques, and these, being cut either transversely or obliquely, form slabs of any required number or thickness, the same pattern being met with at every cutting.—*Smelz glass* is produced by fused lengths of coloured glass rolled into one another, so as to imitate carnelian or other stones. —*Vitro di trino* is fine lace-work with intersecting lines of white enamel or transparent glass, forming a series of diamond-shaped sections; the centre of each having an air-bubble of uniform size.

GLASS-MAKERS' SOAP, a term applied to the black oxide of manganese, which has the remarkable property, when fused with glass, of freeing it from colour.

GLASS-TISSUE, the *tissue de verre* of the French, is a very ingenious method of incorporating with silk, or other fibrous materials, the hair-like filaments of glass, which are drawn out by means of the blow-pipe. The production of these glassy filaments is one of the prettiest of modern arts, as may be seen at the Polytechnic Institution and other places, both public and private. Nothing can exceed their lustrous beauty, when grouped side by side. The inventive faculties have lately been directed to the art of combining these filaments with textile fabrics, especially silk; and the result has been the production of a very beautiful novelty, called 'glass-tissue,' consisting of a woven mixture of silk and glass, for which a patent has been lately taken out. The glass filaments are combined with threads of silk, or of gold and silver; and the material presents all the characteristics of glittering brocade, velvet, or satin, according to the peculiar mode in which the weaving process is managed. It is found, however, that the manufacture of this mixed fabric is rather difficult, owing to the fragility of the glassy threads; and the question arises whether the article will be sufficiently remunerative to the inventor. Cheapness is the fashion of the present day, and this novelty, however beautiful, may be too costly to command an extensive sale.

GLOBES, ARTIFICIAL, are miniature representations of the natural globe (with all its geographical divisions), or of the concave expanse of the firmament, with its principal stars and constellations. The one is called the *terrestrial*, and the other the *celestial* globe. For educational purposes they are of great utility. Besides serving as maps to distinguish the different parts of the earth's surface, or the situations of the fixed stars, they are calculated for illustrating the various phenomena arising from the diurnal and annual motions of the earth, and the different phases and positions of the fixed stars at every period of the year. On these globes there are ten principal circles. The six greater ones are the horizon, the brazen meridian, the equatorial (or equinoctial as it is called on the celestial globe), the ecliptic, and the two colures. The four minor circles are the two tropics, and the two polar circles. Of these circles the equator and ecliptic, with their parallels and secondaries, are fixed. The horizon, with its parallels and secondaries, is moveable. The horizon is an important adjunct to a globe. It consists of a broad wooden circle which runs round it, and divides it into two equal parts, called the upper and lower hemispheres. In this circle the brazen meridian slides up and down, according to the different heights to which it is necessary to elevate the pole. On the flat side of the horizon are described the twelve signs, and the months of the year; and on the brazen meridian, which divides the globe into the eastern and the western hemispheres, are inscribed the different degrees of latitude, each quadrant being divided into 90°. There is also an hour circle, consisting of a flat ring of brass, divided into twenty-four equal parts, or hour distances; and on the pole of the globe is fixed an index, which turns round with the globe, and points out the hours on the hour-circle. On the surface of the celestial globe is represented the concave expanse of the heavens. The stars are all arranged in constellations, under the forms of various animals, whose names and figures are represented on the globe. They were first invented by the ancient astronomers of Egypt, Greece, and Arabia, and are still retained for the sake of distinguishing the respective localities of the heavenly bodies.

These globes are usually composed of plaster or wood, on which the engraved map or description is pasted. But of late years many ingenious methods have been devised for the purpose of facilitating educational instruction. Globes are sometimes made of papier-maché, divided into twenty-four pieces, which can be taken asunder, and reconstructed at pleasure; so as to facilitate removal, or the convenient study of any one part of the globe. A cheap paper globe is sometimes to be met with, in which the printed

gores are brought together by a string; and although this kind of globe may not be exactly spherical, yet it answers every purpose, so far as ready reference is concerned. There is another kind of novelty, made of tissue paper, and inflated with air, which is very useful in a school or lecture-room. It is sometimes twelve feet in diameter, which admits of the descriptions and various divisions being conspicuously represented. In the scholastic circles, globes made of slate have come into very general use, which have the meridians and parallels of latitude marked upon them, and the written details omitted, in order that the blanks may be filled in by the pupils.

GLOT'TALITE, a mineral of a white colour and vitreous lustre, with octahedral crystals, occurring in the trap formation near Port Glasgow. Its specific gravity is 2·181; and its constituents, according to Dr. Thomson, are, silica, 37·014; lime, 23·927; alumina, 16·508; water, 21·250; and peroxide of iron, 0·500.

GLOTTIS (Gr. γλῶττα the lingual organ), in anatomy and music, the orifice or mouth of the larynx, through which the air passes during respiration. It is a small oblong aperture which can be dilated or contracted at pleasure; and, by its different vibratory motions, the tones of the voice are modulated in speaking or singing. Over the glottis is a cartilaginous valve-like organ, called the *Epiglottis* (Gr. *over the glottis*), which acts on the air that issues from the lungs somewhat similar to the key of a wind-instrument. Its structure and muscular action are most admirably adapted for protecting the glottis, and aiding in the production of those various tones, of which the voice, in speaking and singing, is so capable. As a general rule, both the glottis and the larynx, with the accompanying organs, are considerably larger in men than in women; hence the great difference in the strength and volume of their respective voices. The epiglottis, independently of its respiratory functions, has another important duty to perform; and that is to protect the glottis, the larynx, the trachea, and the lungs from the introduction of any foreign substance. When we are in the act of swallowing, it simultaneously closes upon the glottis, and thus protects the passage to the lungs, so as to prevent the food from entering the windpipe.

GLOUCESTERSHIRE (vi. 720–729). According to the census of 1851, the population of the entire county was 458,805; of which 218,187 were males, and 240,618 females. Of houses, inhabited and uninhabited, there were 91,677. The area of the county is 1258 square miles, with 364 persons to every square mile. The population of the principal places was as follows:—

Almondsbury.	1,680	Cheltenham .	35,051
Avening . .	2,321	Cirencester .	6,096
Barton St. Mary	2,696	Coleford . .	2,310
Berkeley . .	4,344	Dursley . .	2,617
Bishop's Cleve	2,117	East Dean . .	7,482
Bisley . . .	4,801	Eastington .	1,886
Bitton . . .	9,452	Fairford . .	1,859
Bristol . . .	137,328	Frampton Cotte-	
Charlton Kings	3,174	rell . . .	1,837
Gloucester .	17,573	Stonehouse .	2,589
Hawkesbury .	2,185	Stow-on-the-	
Henbury . .	2,525	Wold . .	2,250
Horsley . .	2,931	St. George. .	8,905
Kingstanley .	2,095	St. James and	
Leckhampton.	2,149	St. Paul .	7,935
Lydney . .	2,577	Stroud . . .	36,535
Mangotsfield .	3,967	Tetbury . .	2,615
Marshfield. .	1,648	Tewkesbury .	5,878
Minchinhampton	4,469	Thornbury .	1,470
Newent . .	3,306	Thornbury .	4,614
Newent Town lib.	1,547	West Dean .	6,084
Newland . .	4,574	Westbury on	
Newnham . .	1,288	Severn . .	2,498
Northleach .	1,352	Westbury-upon-	
Oldland . .	5,877	Trym . .	2,498
Painswick. .	3,464	Westerleigh .	1,679
Rodborough .	2,208	Winchcomb .	2,052
South Hamlet	1,739	Winterbourne	2,876
Stapleton . .	4,840	Wotton-under-	
Stoke Bishop.	4,213	Edge . .	4,224

GLYCYM'ERIS, a genus of Mollusca, of the family *Myadæ*, the shell of which is oblong and transverse, with both extremities gaping.

GLYPHIS'ODON (Gr. γλύφω to carve, and ὀδοντες teeth), a genus of fishes of the family *Chætodonidæ*, with strong cutting teeth, smooth gills, and a large caudal fin.

GLYPHOG'RAPHY (Gr. γλυφὴ engraving, and γράφω to write), the art of engraving, by the electrotype process, on metallic plates, which has been effectually applied to the engraving of maps and pictorial designs. Thus the ordnance maps, which are of a most elaborate description, are printed from electrotype plates. But perhaps the most curious discovery of all is the union of electrography with photography, for producing glyphographic plates. It has been discovered that varied intensities of light produce different intensities of chemical action in the metal plate employed, and that the galvanic action will eat away the copper to different depths, by which an etched surface is produced with varied depths of lines which are adapted for printing. It is well known that photography is the result of light directed on a carefully-prepared surface; so that, in this case, light may be considered as the painter, and electricity the engraver of pictorial or graphic designs. The art of glyphography is coming daily into general use, and many of our best atlases, and maps of gazetteers, are the productions of this useful invention.

GLYP'TODON (Gr. γλυφὴ, and ὀδοντες teeth), the name of an extinct quadruped of the size of an ox, and so called, by Professor Owen, on account of the fluted character of its teeth. It is of the order *Edentata*, and appears to be allied in structure to the armadillo. Numerous specimens have been discovered in different parts of the country; and in the College of Surgeons there is a fine specimen, with its shell coating almost perfect.

GME'LINITE, a mineral spar, of a white and flesh-red colour, so called in honour of Professor Gmelin of Tubingen. It occurs in six-sided prisms. Its constituents are chiefly silica and alumina, with 20·00 of water; specific gravity 2·0.

GNOME (Gr. γνώμων an interpreter), an imaginary being, supposed to inhabit the interior of the earth. The Cabbalists of old represented them as of small stature, and friendly to man. The gnomes were supposed to be the guardians of mines and concealed treasure. Vigenere calls them *gnomons*.

GODBOTE (Sax. *God*, and *bote* a fine), among the Saxons and Normans, an ecclesiastical penalty for any crime or offence committed against God or his Holy Church; and of this the priest was presumed to be the judge. That which was presented as an offering to God or his service was named *God-gild*.

GOETHITE, a German mineral of a brownish-red colour, the primary form of the crystal being a rhomboidal or rectangular prism. It is chiefly composed of peroxide of iron. It was so named in honour of Goethe, the celebrated poet of Germany.

GOLD (vi. 746-7). Since the discoveries of gold in Australia and California, its importations into Europe have been immense; but so rapidly has it been absorbed by the requirements of trade and commerce, and by its extensive application to the arts, that it still maintains its value as the standard of currency throughout the commercial world. [AUSTRALIA, and CALIFORNIA, *Supplt.*] In 1848 it was computed that the total amount of gold in use in the world was 600,000,000*l.*; and the annual supply was believed to be between eight and nine millions. But from the recent influx consequent on the discoveries in California and Australia, the amount in hand at the present time (1858) is computed at 820,000,000*l.*, or about 205,000,000 oz. From 1849 to 1853, California produced 65,000,000*l.*; and Australia, from 1854 to 1856, 35,000,000*l.* The annual consumption of gold, in our arts and manufactories, is very considerable. The quantity used in the Staffordshire Potteries alone, for gilding porcelain, and making crimson and rose colours, varies from 7000 to 10,000 oz. One establishment in the potteries expends 3500*l.*'s worth of gold per annum, and another 2000*l.*'s worth. In Birmingham not less than 1000 oz. of fine gold are used weekly. For gilding metals by electrotype, which is comparatively a recent invention, and for the water or wash-gilding processes, not less than 10,000 oz. of gold are annually consumed. In the United Kingdom, the weekly consumption of leaf-gold is as follows:—London, 400 oz.; Edinburgh, 35 oz.; Birmingham, 70 oz.; Manchester, 40 oz.; Dublin, 12 oz.; Liverpool, 15 oz.; Leeds, 6 oz.; Glasgow, 6 oz.; total 584 oz. Of this amount not one tenth part can be recovered.

GOLD COAST, an extensive country of Guinea stretching along the shores of the Atlantic Ocean, from Cape Lahu on the west to the river Volta on the east, and bounded on the north by the kingdoms of Dahomey and Ashantee. The English first settled here in 1664; and their principal establishments are Cape Coast Castle and Accra. [GUINEA.]

GOLD COINAGE. According to a parliamentary return, published in April 1858, it appears that the number of sovereigns coined in the year 1857 was 4,495,748, the weight of the metal used being 1,154,606·290 oz. The number of half-sovereigns coined was 728,223, the weight of the metal employed being 93,511·876 oz. The total value of the gold coinage for the year was 4,859,860*l.* 2*s.* 2*d.*, against 11,952,391*l.* 5*s.* 11*d.* in 1853; 9,008,663*l.* 9*s.* 4*d.* in 1855, and 8,742,270*l.* 12*s.* 11*d.* in 1852. The smallest amount coined was in 1850, when the total did not exceed 1,491,836*l.* 17*s.* 9*d.* The gold coinage in Great Britain, France, and the United States, in 1853, amounted to 41,800,000*l.*

GOLD-LACE, is the manufacture of what may be called *silk-lace*, with a silver-gilt coating, which has all the appearance of burnished gold. But so small a quantity of the precious metal is introduced, that perhaps the thinnest gold wire ever manufactured (the thirty-thousandth part of an inch in thickness) does not approach in thinness the film of gold on the surface of the silver and gold-lace. It has been calculated that the gold on the finest silver wire for this lace is not more than one-third of one-millionth of an inch in thickness, or about one-tenth the thickness of ordinary leaf-gold. The process by which this rich-looking material is produced is thus described in 'Novelties and Inventions.' 'The silken-threads for making this material are wound round with gold wire, so thickly as to conceal the silk; and the making of this gold wire is one of the most singular mechanical operations imaginable. In the first place the refiner prepares a solid rod of silver, about an inch in thickness; he heats this rod, applies upon the surface a coating of gold-leaf, burnishes this down, and so on, until the gold is about one-hundredth part the thickness of the silver. Then the rod is subjected to a train of processes which brings it down to a state of fine wire; it is passed through holes in a steel-plate, lessening step by step in diameter. The gold never deserts the silver, but adheres closely to it, and shares all its imitations. It was one-hundredth part the thickness of the silver at the beginning, and it maintains the same ratio to the end.'

GOLD-SIZE, a kind of tenacious and quick-drying varnish, chiefly used by gilders to form the letters and other objects intended to be gilt by means of leaf-gold, which inseparably adheres to the varnish. It is also used by letter-press printers in gold printing.

The rationale of gold-sizing is this. As metals cannot well adhere by contact to any but other metallic substances, when gold is to be applied to the surface of some non-metallic body, as wood, leather, paper, &c., the surface must be previously covered with some sizy or viscid substance, by which gold is made to adhere. These substances may be made of any vegetable or animal glue, or of oily, drying materials, and are usually called *Sizes*. After the application of this size to the surface of any body, thin leaves of finely-beaten gold are spread upon it, and pressed down with a little cotter, or a hare's foot. When the whole is dry, the work, in some cases, undergoes the finishing or polishing process, by being burnished with a hard and smooth instrument. By the application of a gold-coloured size or

varnish, a very fine transparent colour is given to silver and brass, and all the brilliancy of the metals is shown beneath. Many brass ornaments are varnished in this manner; and the process is called *Gold-lacquering*, to distinguish it from real gilding. It is very similar to the beautiful art of *Japanning*, so extensively practised by the Japanese, Chinese, and other nations of the East.

GOLD-WEIGHING MACHINES. Various plans have been suggested for weighing sovereigns and half-sovereigns, at the Bank of England, with precision and despatch; but a little machine, invented by Mr. Cotton, appears to be the most effective ever yet constructed. Its accuracy has been so fully tested, that if a difference of even a hundredth part of a grain existed between two sovereigns, it would be detected. Mr. Cotton was led to the conception of his beautiful machine, by observing the injustice which the Bank sometimes unintentionally inflicted on its customers. Sovereigns issued from the counter at the Bank as being of full weight, were refused at another, as being light. At length Mr. Cotton, with the aid of Mr. Napier, hit upon a plan for constructing a machine which should entirely supersede the ordinary gold balance. It is a light and delicate affair. In the first place there is a small tube (as described by the editor of 'Novelties and Inventions'), in which a pile of twenty or thirty sovereigns is placed in single column. The lowermost sovereign rests upon a moveable plate; when a handle is moved by the attendant, the plate moves sideways, and the sovereign is brought upon an exquisitely sensitive balance; if the weight is correct, a little lever-arm, or pusher, gives the edge of the sovereign a smart impulse, and drives it off into a box; but if the weight be deficient even in the most minute degree, another pusher attacks the sovereign on a different side, and drives it into another box. As the handle is continued in motion, two or three sovereigns may be in different stages of the weighing process at one time. On a rough average, 30,000 sovereigns pass over the Bank counter every day; each machine can weigh 10,000 sovereigns in six hours; and there are six machines; so that the Bank can weigh all its issues of gold by these means, and have reserve power to spare.'

GOLD-WIRE, a cylindrical piece of gilt silver, drawn through a series of holes of different bores, in order to bring it to the intended fineness. Such is the ductility of these metals, that the wire can be reduced to the thinness of the finest hair, without losing its golden appearance.

GOMPHO'SUS (Gr. *γόμφος* a nail, or bolt), a genus of fishes, of the family *Chætonidæ*, in which the mouth is of excessive length and protractility.

GONEP'TERYX (Gr. *γόνος* an offspring, and *πτέρυξ* a wing), a genus of yellow butterflies, of the sub-family *Colianæ*, which are remarkable for their rapidity of wing.

GONGON'HA, a species of Paraguay tea extracted from the leaves of a species of holly, the *Ilex gongonha*. It is much used in Brazil.

GONID'OMUS (Gr. *γωνία* an angle, and *δόμος* a house), a genus of Mollusca, of the family *Helicidæ*, and belonging to the *Helicinæ*, or Land-snails, in which the shell is thick, conical, and obtuse, and the body whorl contracted.

GONIOS'TOMA (Gr. *γωνία*, and *στόμα* the mouth), a genus of Mollusca, of the family *Helicidæ*, and belonging to the *Achatinæ*, or Agate-shells.

GONOCEPH'ALUS (Gr. *γονύω* to produce, and *κεφαλή* the head), a genus of Saurian reptiles, of the family *Iguanidæ*, and allied to the *Agama*.

GON'OPUS (Gr. *γονύω*, and *πούς* the foot), a genus of coleopterous insects, of the family *Melastoma*.

GONORYN'CHUS (Gr. *γονύω*, and *ῥύγχος* a snout), a genus of fishes, with linear elongated bodies, and snout-like heads, belonging to the *Cyprinæ*, or Carps.

GONOS'PIRA (Gr. *γονύω*, and *σπεῖρα* a spire), a genus of Mollusca, with cylindrical shell of equal thickness, and belonging to the *Helicinæ*, or common Land-snails.

GON'YPUS (Gr. *γονύω*, and *πούς* the foot), a genus of diptèrous insects.

GOODALL, REV. DR. JOSEPH, Provost of Eton College, and a distinguished scholar, was born in 1760. He was educated at Eton, and in 1778 was admitted to King's College, Cambridge. He there obtained, in 1782, a University scholarship; and in 1781 and 1782, he gained Sir Wm. Browne's medals for the Greek odes and epigrams. In 1783 he became Fellow of King's College, and was then appointed assistant master at Eton. On the resignation of Dr. Heath, in 1801, he succeeded to the important office of head-master of Eton College; and on the death of Dr. Davies he was appointed to the provostship, at the express desire of George III. In 1827 he was presented to the rectory of West Isley by the Dean and Chapter of Windsor, of which he was canon.

Dr. Goodall was universally respected as a profound scholar, and a distinguished teacher of youth. He was also celebrated for many unostentatious acts of benevolence. Among others may be mentioned his founding a scholarship of 50*l.* per annum, to be held for four years at either of the English Universities. He died in 1840.

GORDIAN KNOT, a term applied to anything of an intricate character, or of difficult solution. 'Cutting the Gordian knot,' originated from the story of Gordius, a Phrygian, who though originally a peasant was raised to the throne. It is thus related by the ancient historians. During a sedition, the Phrygians consulted the oracle, and were told that all their troubles would cease as soon as they chose for their king the first man they met going to the temple of Jupiter, mounted on a chariot. This man was Gordius, who was elected king, and consecrated his chariot in the temple of Jupiter. The knot which fastened the yoke to the beam was tied with so much art, and the strings were twisted in so intricate a manner, that it was impossible to discover where it began or ended. From this circumstance a report was soon spread of the oracle foretelling that the man who could untie it should possess the empire of Asia. Alexander the Great, on his capture of Gordium, being anxious to inspire his soldiers with courage, and make the people believe that

he was destined to conquer Asia, attempted to untie this knot; but failing in his object, he exclaimed (as Quintus Curtius informs us), 'It is no matter which way it is untied,' and at once cut the knot with his sword; and by that means (says the historian) either eluded or fulfilled the oracle: 'Sortem oraculi vel elusit, vel implevit.'

GOR'DIUS (from the Gordian knot), a genus of Abranchiate Annelides (the Hair-worm), whose bodies resemble a knotted thread.

GORGO'NIA, in natural history, a genus of the vermes zoophyta class, growing in the form of a plant, with a coriaceous or horny stem. There are a great variety of species.

GOULARD, a liquid acetate of lead, applied externally in ointments as a remedy for inflammation. It was so called from the name of the inventor.

GOULBURN, RT. HON. HENRY, Secretary of State, Chancellor of the Exchequer, &c., was born in 1784, and educated at Trinity College, Cambridge, where he graduated as M.A. in 1808. Possessing considerable abilities, as a scholar and a statesman, he soon began to play a distinguished part in the arena of political life. In 1807 he was returned to the House of Commons, as member for Horsham, and in February 1810 became Under-Secretary of State for the Home Department. In 1812 he was appointed, by Lord Liverpool, Under-Secretary of State for the Colonies. He afterwards sat as M.P. for West Looe, and from 1826 to 1831, for the borough of Armagh. In 1821 he was appointed Chief Secretary for Ireland, which office he continued to fill under different administrations; but in 1828 the Duke of Wellington selected him to fill the office of Chancellor of the Exchequer, when he thus became a member of the Cabinet. In 1831 he was returned as the representative of the University of Cambridge, along with the Rt. Hon. W. J. Peel, by which Mr. Cavendish and Lord Palmerston were unseated. In 1834, on the formation of Sir R. Peel's first ministry, Mr. Goulburn was appointed Secretary of State for the Home Department, which he held till the breaking up of the administration; but on Sir Robert's restoration to power, in 1841, he selected Mr. Goulburn as Chancellor of the Exchequer. After the retirement of Sir Robert in 1846, Mr. Goulburn took no active part in politics; but he continued warmly to support those measures which were favourable to the principles of free trade. He enjoyed an annual pension of 2000*l.* a year; and in 1850 he was appointed one of the Church Commissioners at a salary of 1000*l.* He died in 1856.

GOUME'LIA, a species of plant, called in Turkey Kenguel, the seeds of which are roasted, ground, and used as coffee. The plant is extensively cultivated in Kair-ar-eh and Komah, and its seeds were shown at the Great Exhibition of 1851.

GOURGAUD, GENERAL GASPARD, a Baron of France, and Grand Cross of the Legion of Honour, was born at Versailles in 1783. He was educated at the Polytechnic School, and entered the 6th Foot Artillery in 1801. General Fouché soon discovered his abilities; and appointed him his aide-de-camp. Napoleon was then engaged in the full career of his military successes, and Gourgaud had the opportunity of distinguishing himself in the memorable battles of Austerlitz, Jena, Friedland, Essling, and Wagram. In the quality of orderly officer to the Emperor, whose favourable notice his gallantry had obtained, he accompanied him to Holland, but soon afterwards returned to France to secure the defences of Aix, Rhé, and Oleron, then menaced by England. He was next engaged at Dresden, Ostrowno, and Smolensko; and by his bravery and skill largely contributed to the victory of Moscow. It is related that at Brienne, in 1814, he courageously saved the life of the Emperor, when attacked by a body of Cossacks, when Napoleon, as a mark of esteem for his bravery, presented him with the sword he had worn when he gained his first victory in Italy, and this sword Gourgaud wore at the battle of Waterloo. He afterwards accompanied Napoleon in his exile in the Isle of St. Helena; but his conduct there did not add to his reputation; for he was charged with giving information to the British Government, to the effect that the complaints about the governor's ill-treatment of Napoleon were without foundation. This involved him in a serious quarrel with Count Segur, who branded him with being an English spy; and he, in return, wrote what he called a refutation of Count Segur's 'History of the Russian Campaign.' He also got into a pamphleteering dispute with Sir Walter Scott, who unmercifully exposed him, and stated that there were documents in the English War Office, written by him at St. Helena, which proved his want of fidelity to his old master. On the death of Napoleon he returned to France; and during the reign of Louis Philippe he was appointed one of his majesty's aide-de-camps, elected a member of the Chamber of Deputies, and made colonel of one of the legions of the National Guard of Paris. He died in 1852.

GRACE-NOTE, in musical composition, any little note added as an ornament or flourish, according to the taste of the composer or performer.—*Graces* is a term applied for those embellishments incidentally introduced by a performer to give fuller effect to a general composition.

GRAKLES (Lat. *gracula* a jackdaw), a genus of tropical birds of the family *Corvidæ*, and order *Picæ*. They have strong thrush-like bills, remarkably large and strong feet; and fine black plumage, beautifully variegated with metallic lustres of blue and green.

GRALLA'RIA (Lat. *grallæ* stilts), a genus of long-legged birds, of the family *Merulidæ*, and belonging to the *Myotherinæ*, or Ant-thrushes.

GRAM (the Chick pea), a general name in India for various kinds of pulse, which are produced from different species of the *Phaseolus* and *Dolichos*, and distinguished by colour; thus the *Dolichos uniflorus* is known as the *horse-gram*, and so on. From its large percentage of gluten, the gram is considered, when roasted, to be more capable of sustaining life, in proportion to its weight, than any other species of food. For this

reason it is selected by travellers, when crossing the desert, when other *food*, on account of its bulkiness, might be inconvenient.

GRAMMARIANS, or GRAMMAT'ICI (Gr. γράμμα a letter, or γραμματικὸς literary), among the classical ancients, a title of literary distinction and honour. Suetonius has written a history of the celebrated grammarians of the Roman empire. Philoponus, a celebrated philosopher and scholar of Justinian's time, was surnamed *Grammaticus*, by way of honourable distinction. The title was not confined to mere pedagogues, but bestowed on those who distinguished themselves in the higher walks of literature and criticism. Those who only taught to read, understand, and explain authors, were termed *Grammatistæ*, in contradistinction to Grammatici. Before the time of Crates, surnamed Mallotes, who lectured on grammar between the second and third Punic wars, it was not even known by the Romans what was the meaning of the term; but Rome afterwards became distinguished above all other nations for the number and brilliancy of her grammarians, whose writings still continue to be read and admired; as Aristarchus, Dionysius, Didymus, Flaccus, Quintilian, &c. During the second century of the Christian era, the most celebrated grammarians were Pollio, Eutychius, Athenæus, Julius Pollux, Macrobius, Aulus Gellius, and others, whose works relate not only to criticisms of ancient writers, but to the general literature of Greece and Rome. (Nuttall's *Class. Dict.*)

GRAMMATOPH'ORA (Gr. *a letter-carrier*), a genus of Saurians, natives of Australia, with triangular flat-heads, and very long and slender tails.

GRAN'ATITE (Lat. *granum* a grain), a brownish-red mineral, occurring in Scotland and America, and in the primary rocks of the Shetland Isles. It chiefly consists of alumina, silica, and oxide of iron.

GRASS, CHINA, is a strong and beautiful fibre, which has long attracted the attention of practical manufacturers. It is very similar to the Rhea fibre of India; and there appears scarcely any limit to the probable supply of this grass from our Indian territories. A simple and effective method of preparing it for use, chiefly depending on the solvent powers of a hot solution of carbonate of soda, has been devised; and this grass has now become one of the component fibres of our mixed fabrics.

GRAZIO'SO (Ital. *graceful*), in music, a term denoting that the passage to which it is prefixed must be executed in a smooth and graceful manner.

GREAT BRITAIN (vi. 827). According to the census of 1851, the entire population of Great Britain amounted to 21,121,967, which may be thus enumerated:—

		Males.	Females.
England	16,921,888	8,281,734	8,640,154
Scotland	2,888,742	1,375,479	1,513,263
Wales	1,005,721	499,491	506,230
British Islands	143,126	66,854	76,272
Army and Navy, and Persons abroad	162,490	162,490	..
Total	21,121,967	10,386,048	10,735,919

Thus we perceive that the females exceeded the males by 349,871. The males at home were 10,223,558; consequently the females exceeded the males by 512,361.

The excess of females over males at each census appears thus:—In 1801, 180,027; 1811, 201,598; 1821, 210,537; 1831, 297,246; 1841, 348,950; 1851, 349,871.

Of the children born alive in England and Wales, from 1839 to 1851, there were 3,634,235 males and 3,465,629 females; from which it follows that there were 104,865 males born to every 100,000 girls; while to every 100,000 girls living there were only 96,741 males. In England and Wales there are 104 females to 100 males; while in Scotland there are 110 females to 100 males. But selecting a few districts and places that are remarkable as diverging from the average, we find that in Hampstead the females were 42 per cent. more than the males; in Kensington, 40; and in Hackney, 32; while in Rotherhithe there were 5 per cent. more males than females; in Greenwich, 4; and in Poplar, 3. But the average of all London is 13 per cent. more females than males. Of towns and places in the country, Bath contains 50 per cent. more females than males; Exeter, 37; Devonport, 26; York, 13; and Manchester, 9. But in the rural districts of Herefordshire, Kent, Stafford, &c., the excess of males over females is considerable. In Windsor the excess is 8 per cent.; in Chatham, 17; and in the district called Woolwich Dockyard, the excess is 55 per cent.

The following is a synoptical view of the population of each county, alphabetically arranged; that of the principal towns being given under the respective counties to which they belong. IRELAND is given under its proper head.

ENGLAND.

Counties.	Population.	Counties.	Population.
Bedford	124,478	Nottingham	270,427
Berks	170,065	Oxford	170,363
Buckingham	163,554	Rutland	22 983
Cambridge	185,405	Salop	229,341
Chester	455,725	Somerset	443,916
Cornwall	355,558	Southampton (Hants).	405,370
Cumberland	195,492	Stafford	608,716
Derby	296,084	Suffolk	337,215
Devon	567,098	Surrey	683.082
Dorset	184,207	Sussex	336,844
Durham	390,997	Warwick	475,013
Essex	369,318	Westmoreland	58,287
Gloucester.	458,805	Wilts	254,221
Hereford	115,489	Worcester.	276,926
Hertford	167,298	York (East Riding)	220,983
Huntingdon	64,183	City of York.	36,303
Kent	615,766	York (North Riding).	215,214
Lancaster.	2,031,236	York (West Riding)	1,325,495
Leicester	230,308	Total	16,921,888
Lincoln	407,222		
Middlesex.	1,886,576		
Monmouth	157,418		
Norfolk	442,714		
Northampton.	212,380		
Northumberland	303,568		

Counties.	Population.
WALES.	
Anglesey	57,327
Brecon	61,474
Cardigan	70,796
Carmarthen	110,632
Carnarvon	87,870
Denbigh	92,583
Flint	68,156
Glamorgan	231,849
Merioneth	38,843
Montgomery	67,355
Pembroke	94,140
Radnor	24,716
Total	1,005,421
SCOTLAND.	
Aberdeen	212,032
Argyle	89,298
Ayr	189,358
Banff	54,171
Berwick	36,297
Bute	16,608
Caithness	38,709
Clackmannan	22,951
Dumbarton	45,103
Dumfries	78,123
Edinburgh	259,435
Elgin (Moray)	38,959
Fife	153,546
Forfar	191,264
Haddington	36,386
Inverness	96,500
Kincardine	34,598
Kinross	8,924
Kirkcudbright, Stewartry of	43,121
Lanark	530,169
Linlithgow	30,135
Nairn	9,956
Orkney and Shetland	62,533
Peebles	10,738
Perth	138,660
Renfrew	161,091
Ross and Cromarty	82,707
Roxburgh	51,642
Selkirk	9,809
Stirling	86,237
Sutherland	25,793
Wigton	43,389
Total	2,888,742

According to the official report of the Registrar-General, the natural increase of the population in the last three months of 1857 was 50,278 in 92 days, or 546 daily in England and Wales. The excess of births over deaths, and therefore the natural increase of the population of England and Wales, was 242,865 in the year 1857, or about 665 daily. In the United Kingdom the natural increase was about 1000 daily. In his report the Registrar-General shows the evil effects of imperfect drainage, uncleanliness, and impure air; and concludes by remarking that of the 28,000,000 of our population numbers do not live out half their days: '140,000 of them,' says the report, 'die every year unnatural deaths; 280,000 are constantly suffering from actual diseases which do not prevail in healthy places; their strength is impaired in a thousand different ways; their affections and intellects are disturbed, deranged, and diminished by the same agencies.'

The following is a general view of the area of Great Britain and Ireland, given in acres:—

England	32,590,429
Wales	4,734,486
Scotland (including 316,160 lake)	16,648,960
Ireland (including 455,399 lake)	20,399,608
Lesser British Islands	2,974,519
Total	77,348,002

The ever-augmenting wealth and vast commercial enterprise of Great Britain, with the rapid advances she is annually making in the arts and sciences, present one of the most wonderful phenomena in the social history of the world. Among the material sources of her national wealth, coal and iron may be looked upon as the principal. Iron forms the body, and coal the soul of her strength. The one is the nerve and sinew; the other the vital energy that puts the whole in motion. 'The iron fingers of her machinery (says an American journal) spin the most delicate and cunning laces, and the iron arms of her shafts move with huge force, accomplishing the labour of hundreds of millions of men; but it is the carbon of her coal that has imparted life-like force and direction to the cold, hard metal, and thus enabled England to perform an amount of physical labour more than equal to that of all the human beings in the world unaided by machinery. All the teeming swarms of her Indian possessions, consuming as they do and must, perform not half the valuable labour for the world that her coal, generating the motive power of steam, is momentarily effecting. This it is that rears all the wealth of British manufacturers, and the peaceful arts of industry, and it is this that enables her to carry so easily her unheard-of public debt, fight battles all over the world, and conduct campaigns to a successful issue, in spite of her numerical feebleness.' [COAL TRADE; IRON TRADE, *Suppl.*]

From 1794 to 1801, Great Britain was enabled to subsidize all Europe to fight her battles against republican France. From 1803 to 1809 she had three coalitions against her—Russia, Prussia, and Austria. Until 1812 she stood alone with her allies—Spain and Portugal—against all Europe. The expenditure was inevitably enormous. In 1812 it was 96,000,000*l.*; in 1813 it exceeded 100,000,000*l.*; in 1814 it was 118,000,000*l.*; and in 1815 the national expenses amounted to 126,000,000*l.* From 1812, however, Great Britain was at the head of the European coalition against Bonaparte, which eventually effected his overthrow. Notwithstanding the vast expenses and the accumulation of a national debt unparalleled in history, the value of her private property has trebled; her shipping has more than doubled itself; and, taking into consideration the general advancement in all other respects, Great Britain possesses three times the ability, as compared with the previous half century, to meet her national liabilities. The last war with Russia afforded sufficient evidence of her ample means. While it continued it exercised only a very small influence in checking the commerce of the country. In the eleven months ending November 1854, our exports were 89,000,000*l.*; in the corresponding period of 1855, when the war was at its height, the exports declined to 86,000,000*l.*; but during the year 1856, to the end of November, their declared value was 105,000,000*l.*; being an increase of nearly twenty millions.

In the four great branches of British manufactures—the cotton, the woollen, the linen, and the silk—the increase during the year 1856 was beyond all precedent. In cotton there was an increase of 60,000,000 yards over the produce of 1854, and 10 per cent. over the value of 1855. [COTTON TRADE, *Suppl.*] The imports of raw wool, to supply the great demands of the manufacturers, were raised from 84,000,000 lbs. to 99,000,000 lbs. [WOOLLEN TRADE, *Suppl.*] In the linen trade there was an increase in the value of goods exported since the conclusion of the

Russian war, of upwards of 25 per cent. over the two preceding years. In the articles of silk, the imports of the raw material increased from 5,500,000 lbs. to 6,300,000 lbs., and the manufacture of the article was in an increased ratio. Thus, in spite of all natural obstacles, and in defiance of the circumstances of war, the value of articles of British manufacture, during the years 1855 and 1856, increased nearly 20,000,000*l.*

According to the last official returns, the total income of the United Kingdom, for 1857-8 amounted to 67,881,513*l.*, and the entire ordinary expenditure to 68,128,859*l.* The net produce of our Custom-house revenue was 23,275,742*l.* for the whole of the United Kingdom; Ireland yielding 2,244,791*l.* The net produce of the Excise revenue was 17,910,641*l.*; of stamps, 7,470,626; and assessed taxes, 3,150,762*l.* The game duty yields 129,943*l.*; dogs' figure for 197,604*l.*; riding horses for 234,376*l.*; horses for 754,044*l.*; and servants for 192,760*l.* The Post-office revenue was 3,038,112*l.* The income tax yielded a net revenue of 11,396,435*l.* The interest, &c., of the public debt was 23,573,973*l.*, and the future annual charge is estimated at 23,459,594*l.* The Civil List figures for 401,257*l.* The value of all the exports from this kingdom in 1857 was 286,124,531*l.*, and that of the imports, 136,215,849*l.* The real or declared value of the produce and manufactures of the United Kingdom exported last year (1857) is calculated at 122,066,107*l.* The same year, 2045 new vessels, of 423,477 tons, were built; and there were registered, at the end of the year, 37,014 vessels, of 5,519,154 tons, employing 284,135 men.

Of the aggregate wealth of the British empire, which has probably trebled itself during the present century, it would be difficult to give a correct estimate. Of the material wealth of England, however, where by far the largest increase has taken place, the following estimate has been given on the authority of Mr. Herapath, the philosopher and mathematician, and perhaps it is the closest approximation that can be presented:—

	£
Value of cultivated soil	1,700,000,000
Railways	300,000,000
Mines	120,000,000
Canals, docks, &c.	200,000,000
Dwellings, factories, &c.	550,000,000
Agricultural implements, &c.	230,000,000
Horses, cattle, sheep, &c.	242,000,000
Manufactured goods	200,000,000
Mercantile shipping	40,000,000
Foreign merchandise paid for	50,000,000
Fisheries, foreign and domestic	5,000,000
Gold and silver, &c.	60,000,000
Waste lands, public buildings, churches, chapels, hospitals, prisons, arsenals, forts, military stores, dockyards, ships of war	750,000,000
	£4,447,000,000

As regards the military and naval power of Great Britain, it is stated by Mr. M. Wraxall that the total strength of the native English army at this time (1858) is 147,089 men; of the East Indian army, 320,000; and of the militia, 120,000. He estimates the navy of Great Britain at 545 ships in commission, or partly equipped (including 94 ships of the line), 150 smaller ships, and a corresponding number of large steamers, which, in case of war, might be rendered available.

In 1853 Great Britain and France entered into an alliance for resisting the aggressive policy of Russia, as regarded the Sultan of Turkey, whose Danubian provinces she had invaded. The French and English fleets simultaneously entered the Black Sea, and on the 27th of March, 1854, war was formally declared. During the course of the year an English and French expedition entered the Black Sea, and destroyed Bomarsund, the capital of the Aland Isles. In the meantime the allied armies of England, France, and Turkey landed in the Crimea, and laid siege to Sebastopol, which, after a hard struggle, was eventually captured, on the 8th of September, 1855. This important event, which tended to humble Russia, led to negotiations, and a treaty of peace was finally ratified at Paris on the 30th of March, 1856. [RUSSIA; TURKEY, *Suppl.*]

GREAVES, a kind of ancient armour for the legs, which were made of brass, copper, tin, or other materials. They are often mentioned by Homer as worn by the Greeks; and they were afterwards adopted by the Romans and the knights of the Middle age.

GREECE, KINGDOM of (vi. 844-8). Since the accession of the Bavarian prince Otho to the throne of Greece, in 1835, the country cannot boast of much political or social progress. German nationality has too strongly prevailed, and not been in accordance with the spirit of the country. Hence political disaffection or lawless brigandage has frequently prevailed. Owing to the general discontent existing for some time previously, on account of the exclusive system of government, a general demonstration in 1843 was made among the Greeks; and an important political revolution, happily without bloodshed, was effected at Athens. The king agreed to give a new constitution, and re-establish the National Assembly. This constitution consisted of two Chambers, a Senate, and a Chamber of Deputies; and the king had the right of choosing the senators from a list of deputies.

In November, 1856, a kind of *exposé* of the political, social, and educational position of Greece, was laid before the world by Mr. Rangabé, the Minister of Finance; and addressed to the representatives of the Greek government at foreign courts. It was a vindication of the ruling policy; but, when treating of the constitution, he admits that the government nominates its own candidate at the parliamentary elections, in order to discipline the electoral operations. He contends that the administration of justice is not impeded by vexatious delays; but that there is a radical defect in the constitution, especially in the judges being removable at the pleasure of the crown.

With respect to education, the document, which may be considered as official, states that out of a population of 1,100,000 souls, there are 60,000 young men devoted to study; and that nearly every commune has a boys' school; and many of them a girls' school.

The army of Greece consists of 9555 men, which costs 5,500,000 drachmas, or one-third of the revenue. Her navy is small; but the mercantile marine has greatly increased. It is enumerated at 1500 vessels of burden, and 2900 smaller ones, which employ 30,000 seamen.

M. Rangabé's circular admits that the Department of Finance requires reform; although the revenue has been on the gradual increase. In the first year of the Greek Kingdom, it amounted to 7,950,000 drachmas; and at the present time it realizes 18,000,000 drachmas. It is chiefly raised by imports, which are taxed at ten per cent., and exports at six per cent. The government proposes to make many high roads, and appeals to European capitalists for means to construct railways.

The frightful system of brigandage, which has so extensively prevailed in some of the provinces, has lately received some checks. During the early part of 1856 ninety-nine brigands were tried, thirty executed, and forty-six condemned to various degrees of imprisonment, or sent to hard labour for life. Brigandage, it is stated, is greatly attributable to the defective arrangements within the Turkish frontiers; but for some time past it has only existed in Bœotia or Attica; and the chief of these were lately annihilated near Mount Parnassus.

GREEK FIRE, a very combustible kind of composition which was first brought into use in the seventh century, and employed in the destruction of the Saracens' ships. The invention is attributed to Callinicus of Heliopolis, in Syria. It was composed of sulphur, naphtha, and other bituminous materials. Its property was to burn the briskest in water, and diffuse itself in every direction. It was blown from large copper tubes either on sea or land. Sometimes it was poured from the walls of a city out of large boilers, or launched in red-hot balls of iron or stone. It has been described, by the authorities of the Middle Age, as 'resembling a long barrel, having a tail the length of a long spear. The noise which it made was like to thunder. It seemed a great dragon of fire flying through the air; and giving so great a light with its flame, that it was seen in the camps as clearly as in broad day.' The Greek fire appears to have been employed by the Saracens against the Crusaders, which created amongst them the greatest horror and consternation. (Nuttall's *Archæol. Dict.*).

GREEN'OCKITE, a crystalline mineral of a beauteous gold colour and vitreous lustre (the sulphuret of cadmium); so called in honour of Lord Greenock. It occurs in hexahedral prisms, with six-sided pyramids, and is chiefly found in the counties of Dumbarton and Renfrew. Its specific gravity is 4·842; and its component parts 77·30 of cadmium; and 22·56 of sulphur.

GREEN'OVITE, a crystalline mineral, of a deep rose colour, consisting chiefly of silica, titanium, and lime. It is found at St. Marcel, in Piedmont; and was so named in honour of Mr. Greenough.

GRENVILLE, RIGHT HON. THOMAS, an accomplished statesman and classical scholar, was born in 1755, and was the son of an equally distinguished statesman, the Rt. Hon. George Grenville, who was the mover of that memorable resolution imposing stamp-duties in America. As the son of one who had been a minister of the crown, Mr. Thomas Grenville early took his seat in the House of Commons under the most favourable auspices; but he became a follower of Charles Fox, and so highly did that minister appreciate his talents and influence, that if the celebrated India bill, brought in by that minister, had proved successful, Mr. Grenville was to have been appointed Governor-General. By a curious train of circumstances, while his father had been the prime instigator of the American war, when that was approaching to a close Mr. Grenville was chosen plenipotentiary, on the part of this country, to negotiate, at Paris, the terms of peace. But a change of ministry broke off the intended negotiations. At the general election of 1784, he lost his seat, and afterwards withdrawing from public life, he devoted himself, with considerable success, to the cultivation of classical literature; for which he was, in after-life, so distinguished. In 1790, however, he was returned for Aldborough, and in 1796 for the town of Buckingham. At this period he had withdrawn himself from Mr. Fox, on account of his strong advocacy of the French Revolution, and given his cordial support to the measures of government—Lord Grenville being then Foreign Secretary. In 1795 Mr. Grenville was appointed minister-extraordinary to the court of Berlin, with the view of engaging the Prussian monarch to unite with England and her allies in resisting the aggressive spirit of republican France; but in this mission he was altogether unsuccessful. In 1800 he was appointed, as some compensation for his disappointments, to the sinecure office of 'Chief Justice in Eyre, south of Trent;' but by the 57th of Geo. III. this office was abolished, and Mr. Grenville was the last of its functionaries. On the death of Mr. Fox, in 1806, he was made First Lord of the Admiralty, which he resigned the following year. Indeed his public life may be said to have reached its close, when the ministry, of which his brother was the head, made way, in 1807, for the re-admission of the Tories. The society of scholars, and the enjoyment of literature, became then more attractive than the collisions of political party, and the midnight vigils of the House of Commons. He died in 1847; and by his will he left his magnificent library of rare and costly books, consisting of 20,000 volumes, and valued at 42,000*l.*, to the library of the British Museum. The collecting of these books occupied nearly fifty years of his life; and his will contains the following passage, in allusion to this magnificent bequest:—'A great part of my library has been purchased from the profits of a sinecure office given to me by the public; and I

feel it to be a debt and a duty that I should acknowledge this obligation by giving that library, so acquired, to the British Museum for the use of the public.'

GRETNA GREEN (v. 618, vi. 869), once celebrated for the clandestine marriages of fugitive lovers, has now lost its long-privileged immunities. In the session of 1856 it was enacted that after the 1st of January, 1857, no marriage should be valid in Scotland, unless the parties had both resided there for six weeks preceding the wedding day; thus virtually annihilating the custom of secret runaway marriages, which had existed from the period when Fleet marriages were abolished in 1754.

GRIEVE, WM., one of the most skilful scene-painters of his age, was born in 1802; and it is remarkable that several members of his family have acquired peculiar reputation in this department of art. With his father and brother he was the principal artist in the preparation of the wonderful scenery formerly brought forward at Drury Lane Theatre. He had also the chief direction of the scenery at the Queen's Opera; and it was by his talents that its reputation for scenic representation was undoubtedly exalted. He began his work of reformation at the Opera House in 1829, by the production of the popular ballet of Masaniello; but his great triumph, as a scene-painter, was on the production of Robert le Diable in 1832. 'The novelty and beauty of the scene representing the resuscitation of the nuns from the tombs' (says the 'Historical Register'), 'took the audience by surprise; and for the first time in theatrical annals, they summoned the artist who painted the scene before the curtain, to receive their testimony of delight.' He died in 1845.

GROAT (Ger. *grot*), a silver coin or money of account, equal to fourpence, which circulates not only in England, but in Germany, Saxony, Bohemia, Poland, Holland, &c. under the different names of *groschen, groots, grots*, &c. Before the reign of Edward III. no silver coin worth more than a penny was ever struck in England; but in 1351 the *grosses*, or great pieces, valued at fourpence, were issued; and it was not until 1504 that shillings were coined; the groats, until then, being the only silver coins in circulation. In 1854, a very large quantity of groats, or fourpenny pieces, were coined, weighing 29$\frac{1}{11}$ grains each; and within the ten years ending with 1856, upwards of 60,000*l.* were coined, and put into circulation; thus affording the greatest convenience in all the minor transactions of trade.

GROUCHY, EMANUEL, MARQUIS OF, a Marshal of France, and one of Napoleon Bonaparte's most distinguished generals, was born at Paris, in 1766. At the breaking out of the French revolution, in 1789, he was a sub-lieutenant of the royal guards, and was destined to take a prominent part in the revolutionary struggles of France. For the important part he took in the Alps and the wars of La Vendée, in 1793, he was appointed general of division; but being a scion of the nobility of France, he was included in the decree which deprived all the nobles of their property and military rank. Notwithstanding this severe blow he joined the army in the capacity of a private soldier, and his distinguished gallantry soon led to the restoration of his honours. In 1798 he served under General Joubert; and on the abdication of the King of Sardinia was instrumental in uniting Piedmont to France. At the battle of Novi he received fourteen wounds, and was taken prisoner. He afterwards distinguished himself on the battle-fields of Hohenlinden, Eylau, Friedland, Wagram, and Moscow; and shortly before the abdication of the Emperor he received the baton of Field-Marshal. On the return of Napoleon from Elba he played a conspicuous part. Previous to the battle of Waterloo he carried the villages of Fleurus and Ligny, and was marching, agreeably to his instructions, in pursuit of Blucher, with a force of 30,000 men, when the battle of Waterloo took place. Not having received instructions in sufficient time, he was unable to take part in the engagement; and to this circumstance the loss of the battle, on the part of the French, has been attributed. From the restoration, in 1815, to the revolution of 1830, his title of Marshal was never acknowledged; but in 1832 he was created Peer of France, and lived till 1847, universally respected as a man and a soldier.

GRUB-STREET, the name of a locality in London, which has been rendered notorious in literary history, as being the seat, not of 'the immortal Nine,' but of the meanest writers of ephemeral productions. The name of the place, and the contemptuous terms 'Grub-street writers,' and 'Grub-street literature,' are familiar to most readers; though perhaps the locality of the one or the origin of the other is known comparatively to few. Thus it often happens that the use of terms will remain, when the circumstances from which they sprang have long passed away.

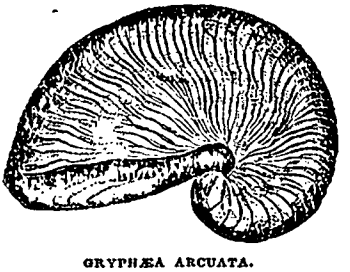
Dr. Johnson, who considered the name of sufficient importance to insert in his immortal Dictionary, informs us that Grub-street was 'originally the name of a street near Moorfields, in London, much inhabited by writers of small histories, dictionaries, and temporary poems; whence any mean production was called *Grub-street*.' This street ran from Chiswell Street to Fore Street, between and parallel to Moor Lane and Whitecross Street; but the name has since been altered to *Milton-street*, where a literary institution was some time ago established, but which has shared the fate of its Grub-street predecessors.

It appears that Grub-street literature existed long anterior to the time of Johnson. From a work entitled 'Memoirs of the Society of Grub-street,' published in 1737, we learn that in the times of King Charles I. there were a number of 'literary guides, who, for the cheapness and obscurity of lodgings, resided in Grub-street, and from their garrets and cellars dispersed those false reports and reasonings, which were very instrumental in stirring up the people at last to a rebellion.'—'The affairs of Grub-street' (continues the same authority) 'being in a disorderly state, about seven years ago (1730), it was thought necessary to endeavour to repress, in some degree

at least, the exorbitances of authors, booksellers, printers, and publishers. This was the end and design of setting up the "Grub-street Journal," by some gentlemen, who, in order to carry it on with greater propriety, formed themselves into an imaginary society, as meeting once a week at the *Pegasus*, which is a real house in Grub Street.'

From the first appearance of the 'Grub-street Journal,' for about a year and a half, the office of secretary was executed every week alternately by two persons, who had agreed to take upon themselves the names of *Bavius* and *Mævius*, and always to subscribe the former to whatever should be presumed to be written by the secretary. Dissatisfaction, however, in the course of time, arising among the proprietors, the secretaries, about the end of 1735, resigned their offices, and the literary department was conducted by the partners themselves. But the publication was not long destined to maintain its ground, and it soon shared the fate of numerous other brochures and scurrilous inanities with which the world was deluged, and society pestered.

GRYPHÆ'A (Gr. γρὺψ a griffin). [vi. 887.] Of this genus of conchiferous fossils, a variety of species have recently been discovered in the lias, the green sand, and the oolite formations of the earth's crust; as *G. columba*, a green sand species; *G. dilatata*, a middle oolite species; *G. virgula* an upper oolite species, &c. But the *G. arcuata* is a fossil peculiarly characteristic of the lower lias shale, seen at Lyme Regis in Dorsetshire, which gives a name to some of the contemporaneous beds on the continent. This fossil very nearly resembles an oyster, to which it is closely allied.



GRYPHÆA ARCUATA.

GUANO (v. 391). The application of guano to manuring purposes is every year becoming more and more extended; and the important results thence arising cannot be over-rated; but, at the same time, it must be observed that a system of adulterating the genuine article, or offering a spurious one for sale, has become but too prevalent. Hence it is that with many agriculturists who are not practical chemists, and have accordingly suffered from their ignorance, the commodity has fallen into disrepute, and in many instances been altogether rejected. Now there are a few simple tests by which the genuineness of the article may be readily demonstrated, or its spuriousness detected. Perhaps the simplest test is by the process of combustion, as described by a German agricultural chemist. For this purpose you will pour half an ounce of the guano intended for examination into an iron spoon, and place it upon red-hot coals until a white or grayish ash is left, which must be weighed after cooling. The less quantity of ash left behind, the better is the guano. The best sorts of Peruvian guano yield (from half an ounce) somewhat more than one drachm of ashes; or about thirty per cent., while the inferior guanos, now so often offered for sale, leave a residue of from two and a half to three drachms (sixty to eighty per cent.), and those intentionally adulterated a still greater quantity of ashes. Of genuine guano, the bad as well as the good, the ash is always white or gray. A reddish or yellow colour indicates adulteration with earth, sand, loam, lime, or gypsum. There is another simple test by drying, and subsequently washing with water. If the guano is a uniform powder, which the best kinds brought from Peru, or Chili, usually are, weigh out two ounces; then spread it upon paper, and let it lie for two days in a moderately warm place, in summer in a dry and airy situation, in winter in a warm room or chamber, in order that the air may dry it. What it may then have lost in weight must be esteemed superfluous water. Many sorts of guano are so moist as to lose by this gentle drying from three to four drachms (twenty to twenty-four per cent.) in their weight. If the guano, like the Patagonian and African, is not of a uniform character, then, in order to obtain a mixture as equable as possible, the lumps, which have frequently an altogether different composition from that of the powdery portions, must be broken in pieces and pulverized, before weighing off, and drying a given quantity.

In Johnstone's 'Agricultural Chemistry' appears the following recipe for an artificial guano. It has formed the basis of many kinds manufactured in this country, and sold at different prices, under different names. The following quantities of materials will be equal to about five hundred weight of guano, and in many places may be made at a cheaper rate than the charges here specified.

	£	s.	d.
315 lbs. Bone-dust (7 bushels at 2s. 9d.)	0	19	0
100 Sulphate of ammonia	0	14	6
20 Pearlash, or 80 lbs. of wood ashes	0	4	0
80 Common Salt	0	1	6
20 Dry Sulphate of Soda	0	2	0
25 Nitrate of Soda	0	5	0
50 Crude Sulphate of Magnesia	0	1	6
610	£2	7	6

GUARANA, the Brazilian cocoa, or bread-cake, which is produced from the seeds of the *Paullinia sorbilis*, and used like cocoa for making a beverage. In quality it is bitter, and somewhat identical with cafferine, or theine, and is usually described by travellers as a variety of coffee. When used, these cakes are mixed with water, and sweetened, in the same manner as we do those of chocolate or cocoa.

GUARAPO, the name of an intoxicating beverage, made from the juice of the sugar-cane, and

chiefly drunk by the negroes and lower orders in South America. Like the sap of the palm-tree, that of the sugar-cane ferments spontaneously; and the liquor contains all the ingredients of the cane juice, except those which disappear during the process of fermentation.

GUARDS, in military matters a body of men, whose duty it is to secure the army, or any place, from surprise; and for this purpose there are various kinds of guards; as the *main-guard, van-guard, rear-guard, baggage-guard, mounted-guard*, &c. But in a special sense the term more immediately applies to the brigade of household troops, whose duty is to protect the person of the sovereign, and who never leave the country unless their services are specially required abroad. Of these, there are three regiments of foot and three of horse-guards. Of the one there are the Grenadiers, the Coldstream, and Scots Fusiliers; and of the other, the First and Second Life-guards, and the Royal Horse-guards. Commissions in these regiments cost more than in others; but the pay is higher, and a grade of superior army rank accompanies each regimental commission. Thus a captain in the guards ranks as a lieutenant-colonel in the army, and a lieutenant as captain. (*Mil. Cyc.*)

GUELPHIC ORDER, a military order established in 1815, entitled the Royal Hanoverian Guelphic Order.

GUERIL'LAS (Span. *guerra* war), a body of men who fight in a desultory manner, and more especially applied to those Spanish *guerilleros* who took up arms against the French during their invasion of the Peninsula. Hence the general operations of that war were distinguished by the activity and determination of the Spanish guerillas, who, without discipline, but acting in concert, assembled in bands at a brief notice, and employed themselves in intercepting detachments and convoys as they passed through the mountains. General Mina, who had 3000 of these men under his command, was one of the principal chiefs, and many extraordinary feats are related as having been performed by him.

GUIDES, in military matters, a corps for obtaining intelligence respecting the country through which an army is passing, and for ascertaining the route or position of the enemy. They invariably accompany head-quarters in time of war. They formerly consisted of the country people in the neighbourhood where an army was encamped, or through which it was marching; but of late years the guides have been formed into a regular corps, with proper officers to command them; and often very useful have they proved in military operations.

GUJERAT, or GUZERAT, a considerable walled town of the Punjaub, seventy-two miles W.N.W. of Lahore, rendered memorable as the scene of the last effort made by the Sikh army against the British forces, under Lord Gough (Feb. 21, 1849), when they were signally defeated, and their territory annexed to the British dominions. In this action the Sikhs lost fifty-three guns, and their army of 60,000 men was entirely broken up and dispersed.

GUM-DRAGON TREE, the *Dracœna draco* of the botanists, is a plant of gigantic growth, and so called from the astringent resin (dragon's blood) which it yields. Its native island is Teneriffe; and tradition relates that this tree was venerated, from the remotest antiquity, by the aborigines of the island. Humboldt mentions the 'gigantic tree of Oratava,' as measuring forty-five feet in circumference a little above the ground, and that in 1400 A.D. it was as large and hollow as it is at the present time.

GUMS (vi. 917–19). Besides the different kinds of Gum-Arabic and Gum-Resins, already noticed, there are various species, which, as being of great use in medicine and the arts, and forming important articles of commerce, may be here alphabetically enumerated:—

Gum-Ammoniacum, an exudation from the bark of the Dorema Ammoniacum of Persia;—*Gum-Anime*, the resinous production of the Locust-tree in the West Indies;—*Gum-Benjamin*, a fragant resin obtained from the bark of the Styrax benzoin, of Sumatra, and a principal ingredient in the tincture called Friar's Balsam;—*Gum-Copel*, the exudation of the Elaphrium excelsum of Mexico;—*Gum-Cystus*, the produce of the genus Cistus, or Rock-rose, of the natural order *Cistaceæ*;—*Dragon's Blood*, a red-coloured resinous exudation obtained from the bark of the Calamus rotang, a native of the East Indies;—*Gum-Elastic*, or Caoutchouc, which is the milky juice of the Jatropa elastica, of the Urceola elastica, and other tropical plants;—*Gum-Elemi*, or Amyris taxandra, a native of the island of Nevis, from which is produced a fragrant resinous juice;—*Gum-Galbanum*, the secretion of Galbanum officinale of Syria;—*Gum-Guiacum*, dark-coloured resinous gum extracted from a tree, the Guiacum officinale, or Lignum vitæ, a native of the West India Islands;—*Gum-Juniper* (or Gum-Sandarach), a resinous exudation from the Juniperus communis;—*Gum-Lac*, the produce of the Butea frondosa, of the West Indies;—*Gum-Mastic*, extracted from the Pistacius lentiscus, of the island of Chios, and used as a stiff varnish;—*Gum-Senegal*, an exudation of the Acacia-Senegal, which is sold as gum arabic:—*Gum-Storax*, a fragrant gum resin, extracted from the Styrax officinale, and used by perfumers to give to spirits of wine a jessamine-like smell;—*Gum-Tragacanth*, the production of the Astragalus tragacantha,—with several others already noticed under their respective heads.

GUM-TREE. [EUCALYPTUS, v. 976.] This tree has been described, by Mr. Buckland, as obtaining an immense size, and forming one of the great wonders of vegetable creation. In Australia it is called *Stringy Bark*; and is, as he says, 'the most gigantic tree of Van Dieman's Land. Some of the specimens exceed 200 feet, rising almost to the height of the Monument in London, before branching. Their trunks also will bear comparison with that stately column both for circumference and straightness. One of them was found to measure 55½ feet round its trunk at five feet from the ground; its height was computed at 250 feet, and its circumference was 70 feet at the

base! My companions spoke to one another, and called to me when on the opposite side of the tree, and their voices sounded so distant that I concluded they had inadvertently quitted me in search of some other object. . . . . At the time when the road was forming through the forest, a man, who had only about 200 yards to go from one company of people to another, lost his way; he shouted, and was repeatedly answered; but getting farther astray among the prodigious trunks, his voice became inaudible, and he perished. . . . A prostrate tree of this kind measured 213 feet long; we ascended the trunk on an inclined plane, formed of one of its huge limbs, and walked—four of us—with ease upon its trunk. In its fall it had hurled down another, 168 feet long, which had brought up with its roots a wall of earth 20 feet across.'

GUN-COTTON, a preparation of cotton-wool, steeped in sulphuric and nitric acid, by which it becomes highly explosive. It was first discovered by M. Braconet, in 1853, that cotton-wool, starch, or saw-dust, when saturated with concentrated nitric acid, became very inflammable, and although not explosive took fire at 365° of heat. This, however, for many years was simply regarded as a chemical curiosity; but in 1846 it was discovered, by Professor Schonbein of Vienna, that cotton became highly explosive when treated with a combination of nitric and sulphuric acids. The acids were mixed in the proportion of one of the former to three of the latter; and after the cooling of the commingling acids had taken place, the rough cotton was immersed in water. When thoroughly soaked, it was squeezed with a brass rod, and the surplus liquid pressed from it. The professor next placed the cotton under a glass vessel for an hour; and after washing it in cold water, squeezed it between rollers. He finally washed it in a weak solution of carbonate of potash, and then dried it in a warm room. After this it was found fit for use as an explosive material. It appears that it has been recently introduced into the Austrian artillery; but from its very explosive nature, and great force, it is liable to burst the ordinary fire-arms now in use, and is not therefore likely to supersede gunpowder. It is found that three grains of gun-cotton are equal to eight grains of the best gunpowder, and only require a smart tap to explode them. It is, moreover, very cleanly, and after exploding leaves no residue behind. It is difficult to calculate the various purposes to which gun-cotton may hereafter be applied; but it has already been found useful in surgery, photography, manufacture of artificial flowers, blasting of rocks, mining, &c.

GUNJAH, the Indian name for the dried hemp plant (*Cannabis sativa*) before the resinous juice has been removed. It is chiefly sold for smoking with tobacco.

GUSTO, or GUSTO'SO (Ital. *taste*), in music, a word (generally written *con gusto*) prefixed to such movements as are to be performed in an elegant and spirited style.

GUTHRIE, GEORGE JAMES, F.R.S., President of the Royal College of Surgeons, &c., was born in 1785, and placed at an early age under the celebrated Dr. Hooper. For many years he practised as a regimental surgeon in North America and the Peninsula. After the Peninsular campaigns he returned to London, and commenced lecturing on surgery, which practice he continued for nearly thirty years. In 1827 he was appointed surgeon to the Westminster Hospital, and in 1833 was elected President of the Royal College of Surgeons. He also held the office of Professor of Anatomy and Surgery; and such was the high opinion the members of the college entertained of his abilities and surgical skill, that in 1842 and 1855 the same honours were again conferred upon him, this being the only instance on record of the same person being three times honoured with this distinguished position. Mr. Guthrie was the author of several works which rank high in the profession; among others, his 'Treatise on Gun-shot Wounds of the Extremities;' 'Clinical Lectures on Compound Fractures;' 'On Injuries of the Hand, Chest, and Abdomen;' 'Diseases and Injuries of the Arteries;' 'On the Anatomy and Diseases of the Bladder and Urethra;' 'Extraction of Cataract,' &c. He died in 1856.

GUTTA PERCHA. The various purposes to which this material can be applied have already been mentioned, [vol. vi. p. 937; ACOUSTIC TUBES, *Supplt.*] The tree which produces it grows to a considerable size, and sometimes measures eleven or twelve feet in circumference. It has thus been technically described by our countryman Dr. Lindley:—'Natural order, Sapotads; genus, Isonandra; species, Gutta. Leaves on long stalks, obovate-oblong, with a short point, golden beneath; flowers axillary, fascicled; stamens, 12; *Habitat*, Malay Archipelago.'

GUTTA PERCHA TREE.

The *Sapotaceæ*, under which the Gutta percha is classified by Dr. Lindley, are a natural order of Exogenous plants, chiefly tropical and lactescent, with alternate extipulate leaves, and axillary inflorescence. The fruit of the Sapota, or Sapotilla-tree, is about the size of an apple, and when ripe of a delicious mellow flavour.

In addition to the many useful purposes, to which Gutta percha has already been applied, we find that a perpetual course of invention has accompanied its manufacturing history from its first introduction into this country. Thus, whenever the gutta percha is to be applied to some new or useful object, tools and processes of a novel character have to be employed. If an ornamental application is determined on (says the author of 'Novelties and Inventions,' in his account of the Gutta Percha Company, of the City Road Basin), new methods 'are adopted for developing any natural beauty which the grain of the substance may present. If an attempt be made to supersede leather, or wood, or papier maché, or metal, by this singular gum, great pains are bestowed on a study of the special qualities to be imitated; and the process of imitation often requires operations and tools differing considerably from those before employed. The first process consists in cutting the blocks into slices. There is a vertical wheel, on the face of which are fixed three knives or blades; and while this wheel is rotating with a speed of 200 turns a minute, a block of gutta percha is supplied to it, and speedily cut into thin slices, much on the same principle as a turnip-cutter performs its work. To bring about a uniformity is the object of the shredding or tearing process. The slices are thrown into a tank of water, which is heated by steam to such a temperature as to soften the mass; the dirt and heavy impurities fall to the bottom, leaving a pasty mass of gum; and the mass, being thrown into another rotating machine, is there so torn and rent, and dragged asunder by jagged teeth, as to be reduced to fragments. The fragments fall into water, upon the surface of which (owing to the small specific gravity of the material) they float, while any remaining dirt or impurity falls to the bottom. These fragments are next converted into a dough-like substance by another softening with hot water, and the dough undergoes a thorough kneading. It is placed in hollow heated iron cylinders, in which revolving drums so completely turn, and squeeze, and mix the now-purified mass, that all parts become alike, and every particle presents a family likeness to its neighbour. The kneaded state may be considered the dividing line between the preparatory processes and those which relate to the fashioning of the material. The soft ductile mass may be formed either into sheets or tubes. In forming sheets, the mass is passed between steel rollers, placed at a distance apart, corresponding with the thickness of the sheet to be made, whether for the heels of a rough-booted pedestrian, or for the delicate gutta-percha tissue, now so much employed by surgeons. By the time that the substance has passed through the rollers it has cooled sufficiently to assume a solid, firm consistency. By the adjustment of a few knife edges, the sheet may be cut into bands or strips of any width, before leaving the machine. In making tubes and pipes the soft mass of kneaded gutta percha is passed through heated iron cylinders, when a similar modification of the wire-drawing process reduces it to the desired form and dimensions. From the sheets and tubes thus made, numberless articles are produced by cutting and pressing. Machines, somewhat like those used in cutting paper, are employed to cut the gutta percha into pieces. If for shoe soles, a cutting press produces a dozen or so at one moment; if for string or thread, narrow parallel slips are cut, which are then rounded or finished by hand; if for producing stamped decorative articles, the sheets are cut into pieces, and each piece is warmed and softened, to enable it to take the impress of a mould or die. But the mode of casing copper wire for electro-telegraphic purposes is, perhaps, one of the most singular applications of the material in form of sheet. Several wires are laid parallel, a strip of gutta percha is placed beneath them, another strip is placed above them, and the whole are pressed between two surfaces of the gutta percha firmly together and to the wires, while the edges between the grooves indent the gutta percha so deeply, that it may easily be separated longitudinally, each slip containing its own core of copper.'

Of such artistic as well as social importance has this material become, that the Council of the Society of Arts have appointed a committee to undertake the direction of a series of experiments on gutta percha, for the purpose of ascertaining with certainty its different qualities, its adulterations, the cause of its decay, and other points of interest or importance. Their instructions are to issue a series of queries for general circulation among those who are most likely to afford the required information; and it has been suggested that one object of the different experiments is, or ought to be, the artificial production of gutta percha, by the chemical conversion of such bituminous substances as are always in abundance; such as resins, pitch, asphalte, &c.

GUT'TURAL (Lat. *guttur* the throat), in elocution and orthoëpy, a term applied to sounds, letters, or syllables, pronounced or formed in the throat. In music, it is an epithet applied to that style of intonation, which the Italians call 'singing in the throat.'

GUTZLAFF, REV. DR. CHARLES, a distinguished Chinese scholar, and secretary to the Hong Kong government, was born in Pomerania, in 1803. He was first sent to the East by the Netherlands Missionary Society, in 1827; and, after spending four years in Batavia, Singapore, and Siam, he went to China, where his critical knowledge of the language and manners of the inhabitants enabled him to enter the country on a familiar footing, and thus obtain a more intimate acquaintance with China and its inhabitants than any other European. He subsequently published his journals, which are of a most interesting character. On the death of Dr. Morrison, in 1834, Mr. Gutzlaff was engaged as interpreter to the British Superintendency, which

position he held during the war with the Chinese Empire in 1841-2. He afterwards received the appointment of Chinese Secretary to the British plenipotentiary and Superintendent of Trade. This position he held to the time of his death, which took place in 1851.

Mr. Gutzlaff's researches in China have been published in various forms. In addition to his journals of different voyages along the coast of China, he published 'A Sketch of Chinese History, ancient and modern;'—'China opened; or a Display of the Topography, History, &c. of the Chinese Empire;'—'Memoirs of the late Emperor of China, and the Court of Pekin,' &c.

GWILT, GEORGE, an eminent architect and antiquary, was born in the county of Surrey in 1775. He was the son of George Gwilt, an architect of some celebrity, who erected the Newington Sessions House, Horsemonger Lane Gaol, and many other public edifices in the locality. The professional knowledge of the son was chiefly obtained in the office of his father, whom he succeeded in business. At a very early age he displayed considerable taste for antiquities, which eventually introduced him to an extensive connection. In 1815 he became a Fellow of the Society of Antiquaries, and in 1818 he was engaged upon the restoration of the steeple of Bow Church, a work which required considerable skill and knowledge of ancient architectural details. In 1822 he undertook the restoration of the tower and choir, and afterwards of the Lady Chapel, of St. Mary Overy's Church, in Southwark, which are considered as among the most interesting works of art in the metropolis. He died in 1856, at the advanced age of 81.

GYMNAPIS'TES (Gr. *γυμνὸς* bare, or naked, and *ἄπιστος* treacherous), a genus of fishes of the family *Scorpænidæ*, whose bodies are naked, and the anal fins furnished with three strong spiny rays.

GYMNAR'CHUS (Gr. *γυμνὸς*, and *ἀρχὸς* head), a genus of fishes of the eel kind, and of the family *Sternarchidæ*.

GYMNE'MA (Gr. *γυμνὸς* bare, and *νῆμα* a thread, in reference to the stamens), a genus of twining shrubs, of the order *Asclepiadaceæ*. There are many different species which possess a variety of uses; for instance, the *G. tingens*, of the East Indies, produces indigo of a most excellent quality. From the *G. lactiferum* of Ceylon a milky juice is exuded, which, together with the boiled leaves, is used by the Cingalese for food. The leaves of the *G. Sylvestre*, when chewed, have the singular property of taking away the power of tasting sugar for twenty-four hours, without otherwise injuring the general sense of taste.

GYMNE'TES (Gr. *nakedness*), a genus of the family *Gymnetres* or Ribbon-fishes, with thin bodies and long ventral fins.

GYMNOCAN'THUS (Gr. *γυμνὸς*, and *ἄκανθα* a spine), a genus of fishes, of the family *Cottidæ*, or Bull-heads; the head naked, and the ventral fins very long.

GYM'NOGENS (Gr. *γυμνὸς*, and *γεννάω* to bring forth), an order of plants comprising (according to Lindley) the natural orders *Cycadeaceæ*, *Pinaceæ*, *Taxaceæ*, and *Gnetaceæ*, or Joint-firs.

[In Zoology and Botany, the word *gumnos*, denoting bareness, or nakedness, is extensively used as a compound in the formation of numerous scientific terms. Thus *Gymnocephalus* (bare-headed), in zoology, is a genus of birds belonging to the Coracenæ, or Fruit-crows, commonly called Bald-tyrants;—*Gymnodactylos* (bare-fingered), is a genus of Saurian reptiles belonging to the Gecko family;—*Gymnodontes* (naked-toothed), is a term applied to a family of Malacopterygious fishes, of the order Plectognathes, whose jaws, instead of teeth, are furnished with a smooth ivory substance;—*Gymnogaster* (bare-bellied), is a genus of fishes of the tribe Gymnetres, or Ribbon-fishes;—*Gymnomyza* (naked fly), a genus of dipterous insects of the Muscidæ tribe;—*Gymnophryx* (naked eyebrow), a genus of birds of the Meliphagidæ family, or Honey-sucker;—*Gymnopleurus* (bare-ribbed), is a genus of coleopterous insects of the family Scarabeidæ;—*Gymnosoma* (bare-bodied), a genus of the order Aporobranchiata, which have no shells;—*Gymnotus* (bare-backed), is a genus of Apodal fishes, with eel-shaped bodies;—*Gymnure* (bare-tailed), is a genus of animals of the digitigrade tribe;—*Gymnandra* (naked male), in Botany, is a genus of glabrous shrubs, of the order Scrophulariaceæ;—*Gymnanthera* (naked anther), is a genus of plants of the order Asclepiadaceæ;—*Gymnocarpus* (naked fruit), is a genus of shrubby plants, of the order Illicebraceæ;—*Gymnogramma* (bare-characters), is a genus of ferns, of the order Polypodiaceæ;—*Gymnosperma* (naked seed), is a genus of composite plants, of the sub-order Tubulifloræ;—*Gymnostachys* (naked spike), is a genus of leguminous plants, of the sub-order Papilionaceæ, natives of New Holland.]

GYMNOS'OPHISTS (Gr. *γυμνὸς* naked, and *σοφιστὴς* a sophist), a sect of Indian philosophers, frequently mentioned by the Greek writers, and so called from their habit of going almost naked. Their manners and habits were not unlike the Cynics of the Greeks, as personified by Diogenes. They were frequently consulted by the highest personages in cases of difficulty or importance; and great reliance was reposed in them. They would not, however, wait upon their inquirers, but obliged them to send their messages, or to come themselves. They lived upon the natural productions of the earth without culture, and did not form themselves into societies, as other sects did; but each one had his particular place of retirement, where he studied in solitude, and performed his devotions. They were very strict in their frequent examinations of their disciples, or scholars, in order to ascertain the improvements they had made in the different branches of learning, or the especial virtues or good deeds they had practised since the previous examination. They believed in the immortality of the soul, and its migration into different bodies. The Gymnosophists are mentioned and particularly described by Diogenes Laertius. According to Jerome and Clemens, their great leader was one Buddas, or

Butta; but Suidas classes him among the Brachmans, from whom the modern Brahmins have doubtlessly originated.

GYNOCH'THODES (Gr. *γυνὴ* a female, and *ὄχθος* a wart), a genus of plants, of the order *Cinchonaceæ*, natives of Japan.

[In Botany, there are many genera of plants compounded of the word *gynè* (a female, in allusion to the pistil of the flower); as *Gynopachys* (thick pistil), a genus of climbing shrubs, of the same order and country as the above;—*Gynophore* (a bearing female, or pistil), a term applying to the receptacle of a flower having the petals, stamens, and pistil, but not the calyx;—*Gynostemma* (a crowned female), a genus of climbing-shrubs, of the order Memispermaceæ, natives of Java, and so named from the ovaries being crowned by the permanent stigmas.]

GYNŒ'CIUM (Gr. *γυνὴ* a woman, and *οἶκος* a dwelling), among the ancient Greeks a room set apart for the women, who were occupied with operations of the needle or the loom, or other domestic duties. Among the Romans it was a depôt for clothes or furniture, where females were constantly at work. In the Middle age, the term was also applied to any private apartment in the house or mansion, where the women were in the habit of making clothes, or preparing the needle-work furniture of the household.

GYRIN'IDÆ (Gr. *γῦρος* a circle), a family of Coleopterous insects (the Water-beetles, or Whirligigs), of which *Gyrinus* is the type. They are so called from their habit of swimming in circles on the surface of the water; and the velocity with which they execute their evolutions is really surprising. The French have given them the name of *Tourniquets*.

GYROL'EPIS (Gr. *γῦρος*, and *λεπὶς* a scale), a genus of fossil fishes, whose remains occur in the bone-beds of the lias formation, and also in the new red sandstone.

GYRON'CHUS (Gr. *γῦρος*, and *ὄνυξ* a nail), a genus of fossil ganoid fishes, from the oolite of Stonefield. (Craig.)

GYROPRISTES (Gr. *γῦρος*, and *πριστὴς* a saw), a genus of fossil placoid fishes, from the new red sandstone.

GYROS'TEUS (Gr. *γῦρος*, and *ὀστέον* a bone), a genus of fossil ganoid fishes found in the lias formation.

H.

HADDINGTONSHIRE (vi. 960-2). According to the census of 1851, the population of the county was 36,386, and inhabited houses, 6444; the area 291 square miles, or 185,937 acres. The population of the principal places was as follows:—

Berwick (North)	1643	Dunbar . bor.	3038
——— . bor.	863	Haddington . .	5525
Dunbar . par.	4415	——— bor.	3883
——— . t.	3013		

HADES (Gr. *ἅδης* the grave), in ancient theology and classical mythology, the nether world, or place of departed spirits, of which various opinions have been formed, and most horrible pictures drawn, according to the imagination or fanaticism of the writers. In Scripture-history it is translated *hell*, which, in modern times, is considered as too harsh-sounding for ears polite. In Luke xvi. 23, we have, *Καὶ ἐν τῷ Ἅδῃ ἐπάρας τοὺς ὀφθαλμούς* (and in hell he lift up his eyes). As Calmet observes, 'Jews, Mussulmen, and Christians, have all depicted the horrors and the punishment of hell as their several fancies have conceived, and according to various images derived from bodily tortures and pangs.' The term, in all probability, was derived by the Greeks from the ancient Egyptians, who considered Hades as a place of separate abode for the soul preparatory to judgment; whence, in all probability, the Romish doctrine of purgatory, as derived from the Romans, originally sprang. [GEHENNA, *Suppl.*]

HALICHŒ'RUS (Gr. *ἅλς* the sea, and *χοῖρος* a pig), in zoology, a genus of cetaceans, known as the Grey-seal. It is distinguished by a very flat head, and a deep and obliquely-truncated muzzle.

HALL, ELIZABETH, a lady of considerable literary attainments, whose productions are replete with good sense and varied information. She was born at Belfast, in Ireland, in 1758, and was the author of 'Memoirs of Modern Philosophers,'—a work which is still held in estimation; the 'Life of Agrippina;' 'Letters of a Hindoo Rajah;' 'Elementary Principles of Education;' 'Letters on the Formation of the Religious and Moral Principle;' 'Popular Essays;' and various other works connected with general literature. She died in 1816.

HALL-MOTE, a term among the Anglo-Saxons which signified a convention of citizens in the general hall where they were in the habit of assembling. It was sometimes called *folk-mote*. At other times the name was applied to the manorial court of the lord, where disputes between the tenants were settled, as in the courts-baron of the Norman era.

HAMADRY'ADES (Gr. *ἅμα* together, *δρῦς* an oak), a name frequently mentioned by the Greek and Roman poets, and applied to certain woodland deities who were presumed to be the divinities presiding over woods and forests, or even over particular trees with which they were co-existent.

HAMILTON, SIR WILLIAM, Bart., Ph. D., and Professor of Logic in the University of Edin-

burgh, was born in Glasgow, in 1788. He was for some time a student of the University of that city, and afterwards went to Oxford, where he obtained the first-class honours. In 1813 he was called to the bar; but his studies were more directed to literature and philosophy than law; and in 1821 he was appointed Professor of Universal History in the University of Edinburgh. In 1836 he obtained the chair of Logic and Metaphysics; and under his powerful ægis those subjects assumed an importance which, from the days of Dugald Stewart, Scotland may be said to have lost. While pursuing the inductive methods of Reid and Stewart, he enunciated the Philosophy of the Absolute as one great step made in advance of his predecessors of the Scottish School of Metaphysics. In 1852 Sir William published a volume of Essays (chiefly consisting of articles previously published in the Edinburgh Review), entitled 'Discussions in Philosophy, Literature, Education, and University Reform.' In 1854 he brought out the first volume of the collected works of Dugald Stewart, to which he had devoted many years' close attention; but death arrested his career before its completion. He died in 1856. 'By the death of Sir Wm. Hamilton,' writes the *Daily Scotsman*, 'Scotland has lost one of the most illustrious of her sons. His attainments in general erudition were of the highest order; at once so varied and minute as rarely to be equalled, and in these times certainly unsurpassed. His writings and academic teaching have inaugurated a new era in the history of Scottish speculation.'

HAMPSHIRE (vi. 1006-10). According to the census of 1851, the entire population of the county was 405,370, of which 202,014 were males, and 203,356 females. Of houses, inhabited and uninhabited, there were 78,781. The area of the county was computed at 1672 square miles, or 1,070,216 acres, comprehending 240 persons to each mile. The population of the principal parishes and towns was as follows:—

Alton . . .	2,828	Millbrook . .	6,121
Alverstoke . .	7,062	Milford . . .	1,782
Andover mun.	5,187	New Alresford.	1,618
——— parl.	5,395	Newport. . .	8,047
Basingstoke .	4,263	Odiham . . .	2,811
Bishop's Waltham	2,265	Petersfield . .	5,550
Boldre . . .	2,874	Portsmouth with	
Brading . . .	3,046	Portsea . .	72,096
Carisbrooke .	6,712	Ringwood . .	8,928
Christchurch .	7,475	Romsey extra .	3,574
Crondall. . .	2,431	Romsey infra. .	2,080
Droxford . .	2,005	Ryde. . . .	7,147
Eling. . . .	5,852	St. Helen's . .	1,948
Fareham. . .	3,451	Southampton .	35,305
Fawley . . .	1,801	Titchfield . .	3,956
Fordingbridge .	3,096	Ventnor. . .	2,569
Gosport . . .	7,414	Warblington .	2,302
Hambledon. .	2,052	West Cowes .	4,786
Havant . . .	2,416	Whippingham .	3,100
Kingsclere . .	2,885	Whitchurch .	1,911
Lymington mun.	2,651	Winchester. .	13,701
——— parl.	5,282	Yateley . . .	2,156
Lyndhurst . .	1,527		

HANG-CHEW, a large city of China, situated on the river Yang-tze-kang, and near the basin of the grand canal. It is the capital of the province of Tche-kiang, and one of the five first-class cities of the empire. It is extremely populous, and the number of inhabitants are supposed to equal the population of Pekin. Not less than 60,000 persons are said to be employed on the manufacture of silk.

HANGING GARDENS, a term commonly applied to the celebrated gardens of Babylon, which are frequently mentioned in ancient history, and fully described by Herodotus, Diodorus, and other Greek writers. So magnificent and extensive was their structure, that they have been classed among the seven wonders of the world. It is related that they occupied a square of 400 feet on every side; and the different terraces were carried upwards one above another, until the height equalled that of the walls of the city. This prodigious work was constructed by Nebuchadnezzar, for the gratification of his favourite wife Amytis, who was the daughter of a Median king, and wished to have something constructed to imitate the grandeur of her native mountain woods and forests. The whole was sustained by stupendous arches; and the soil laid upon them was sufficiently deep to enable the largest trees to take root therein.

HANGO, the name of a promontory and small town on the coast of the gulf of Finland, belonging to Russia, and notorious for the treacherous massacre, during the last war, of a party of English who had landed with a flag of truce. It has a harbour and custom house, and is situated 20 miles E. of Eknas, in lat. 59° 46′, and long. 22° 57′. Off this promontory the Swedes were defeated by the Russians in 1714.

HARCOURT, RIGHT HON. and MOST REV. EDWARD, Lord Archbishop of York, was the youngest son of George first Lord Vernon, and born at Sudbury Hall, co. Derby, in 1757. He was educated at Westminster, and afterwards at Christ Church, Oxford, where he received the degree of D.C.L. in 1786. At an early age he was instituted to the family living of Sudbury, appointed a prebendary of Gloucester, and made a canon of Christ Church. In 1791 he was consecrated Bishop of Carlisle, and translated, in 1807, to the archiepiscopal see of York, which he continued to hold for the lengthened period of forty years. The literary efforts of his lordship scarcely extended beyond the range of his sermons,—a few only of which, delivered on special occasions, have appeared in print. He died in 1847, aged 90.

HARDINGE, RT. HON. HENRY LORD, late Governor-General of India, a field-marshal of England, and commander-in-chief of the British forces, was a younger son of the Rev. H. Hardinge, Rector of Stanhope, county Durham, and born in 1785. Few men have had more experience in the tented field. He entered the army as an ensign in his fifteenth year; and through the whole of the Peninsular war was distinguished for his early gallantry. From 1809 to 1813 he was attached to the Portuguese army as deputy quarter-master-general, and was

present at the battles of Busaco, Albuero, Salamanca, Vittoria, Pampeluna, the Pyrenees, Nivelle, and Orthes, and at the siege of Badajos and Ciudad Rodrigo. He was again engaged in the campaign of Waterloo, and lost his left hand at the battle of Ligny. On the restoration of peace, our hero had the opportunity of resting on his military laurels; but at the end of eight years he was destined to shine in another sphere of action, as a politician and a statesman. In 1823 he was appointed clerk of the ordnance, and entered Parliament in 1826. During the premiership of the Duke of Wellington, he was made Secretary of War; and in 1830 was appointed Secretary of Ireland. When Sir Robert Peel came into power he resumed his post of Secretary of War, and efficiently discharged its duties till 1844, when he was appointed to the important position of governor-general of India. There are few epochs in the eventful history of our Indian empire more momentous than the one for which the administration of Sir Henry Hardinge was distinguished. The war with the Seiks, who at one time threatened the safety of our northern territories, will be ever memorable in history. The battles of Moodkee, Aliwal, and Sobraon, in which Sir Henry took a prominent part, have immortalized the period. Throughout the whole of that campaign, the governor-general, though virtually superintending the conduct of the war, was content to act as second in command, and nobly to submit to the wishes and directions of the commander-in-chief. On the termination of this severe but important contest, Sir Henry was created Viscount Hardinge of Lahore. Parliament granted him an annuity of 3000*l.* for himself and his two next successors; and the East India Company gave him a pension, in addition, of 5000*l.* a year. On the death of the Duke of Wellington, in 1852, Lord Hardinge was appointed commander-in-chief; and during the same year was advanced to the rank of field-marshal, being the highest reward which can be conferred on military genius. He died in 1856.

HARE, VEN. ARCHDEACON JULIUS CHARLES, was born at Hurstmonceux, in Sussex, in 1796. He graduated as M.A. at Cambridge in 1819; was instituted to the rectory of Hurstmonceux in 1832; appointed Archdeacon of Lewes in 1840; and collated to a prebend at Chichester in 1851. In 1847 he published, in conjunction with a younger brother, a volume of miscellaneous thoughts and observations, entitled, 'Guesses at Truth, by two Brothers,' which passed through various editions. His translation, however, of 'Niebuhr's History of Rome,' in 1828, more generally attracted the notice of the literary world. But he became still more distinguished by his theological and controversial writings, which extend over a period of nearly thirty years. Among others may be noticed, 'The Means of Unity' (1847); 'The Duty of the Church in Times of Trial' (1848); 'The True Remedy for the Evils of the Age' (1850); 'The Contest with Rome' (1852); besides a great number of Charges and Sermons at different periods. In 1848 he edited the Essays and Tales of John Stirling, with a Memoir of his life. The tolerant character of the biographer was well calculated to appease that *odium theologicum* which too frequently pervades an assembly of divines. He died in 1855.

HARLEY, JOHN P., a popular comedian, and for many years chairman of the Drury-lane Theatrical Fund, was born in London in 1786; and at a very early age adopted the stage as a profession. He first made his *début* in 1815 on the metropolitan boards at the English Opera House, in the character of Marcelle, in the 'Devil's Bridge,' and Peter Fidget in 'The Boarding House.' He soon afterwards made his appearance on the boards of old Drury in the character of Lissardo, in 'The Wonder;' since which he has continued to maintain a high position in public favour, as a lively and mirth-inspiring comedian. During the later period of his life he constantly played at the Princess's Theatre, where he was a deserved favourite. His last principal performance was in the laughable farce of 'Samuel in search of a Wife.' He died, Aug. 22, 1858, from a stroke of paralysis, with which he had been suddenly seized the previous night, while acting his favourite character of Launcelot Gobbo; and it may be truly said that in his peculiar line he has left a blank which will not readily be supplied.

HARMAT'TAN, the name of a hot suffocating wind, which blows from the interior of Africa towards the Atlantic Ocean. The term is derived from the Fantees, a nation on the Gold Coast, where this terrible blast is the most prevalent. It occurs during the months of December, January, and February; and sometimes it continues with unremitting violence for six or seven days. It takes its rise in the great desert of Sahara, and passes over Senegambia and Guinea to that part of the coast of Africa, lying between Cape Verde in N. lat. 15°, to Cape Lopez in S. lat. 1°, an extent of coast line nearly 2000 miles. Extreme dryness is the property of the Harmattan; and during its continuance there is not the least appearance of moisture in the atmosphere. No dew falls; the grass withers; and all vegetation of a tender description is sure to perish. The very furniture of the house and the panels of the doors crack and split from excessive heat and dryness. Still, with all these annoyances, the Harmattan, however destructive to vegetable life, is considered as highly conducive to health. During its influence fevers disappear, and the most malignant diseases are alleviated. The cause may be thus accounted for:—the wind immediately follows the rainy and unhealthy season on the African coast, and by its excessive dryness dispels the humidity from the atmosphere, and counteracts its baneful effects on the animal system. It is thus in the physical as in the moral world,—

"All partial evil, universal good."

HARP, among the Romans, the name of a species of framework used by the soldiers as a drawbridge when besieging the walls of a city, and so called from its resemblance to a harp.

HARPAG'INES (Gr. ἅρπαγες hooks), naval

implements of war used by the ancients for catching hold of the enemy's ships, and raising them up in the air, by which they were frequently sunk or destroyed.

HARPIES (Gr. ἁρπάζω to seize), in mythological history, a kind of winged monsters, with faces like women, bodies like vultures, and hands and feet hooked, like the talons of a bird of prey. They are often mentioned by the poets under the names of Aello, Ocypete, and Celeno; and are noticed in the third Book of Virgil's 'Æneid,' as having plundered Æneas during his voyage towards Italy, and predicted many of the misfortunes which accompanied his journey.

HARRIS, GENERAL LORD GEORGE, one of the most distinguished officers of our Anglo-Indian army, was born at Brasted in Kent, in 1746. After passing through the different grades of regimental rank, in 1799 he proceeded to India, as lieut.-col. of the 76th Regiment, and as secretary to Sir W. Meadow, who had been appointed governor and commander-in-chief of Madras. Col. Harris was actively engaged in 1790 and 1791 against Tippoo Saib; and on his return to England, in 1794, he was appointed to the rank of major-general. He soon afterwards re-embarked for India, and received the appointment of commander-in-chief under the presidency of Fort St. George. In 1798 he was chosen by the Earl of Mornington to command the army against the Sultan Tippoo Saib, with a force of about 50,000 men. His skill and bravery in this important undertaking are matters of history. He eventually effected the capture of Seringapatam, and the annexation of the dominions of Tippoo to the Eastern dependencies of the British crown. In acknowledgment of his distinguished services, he was in 1815 raised to the peerage, by the title of Lord Harris, of Seringapatam and Mysore in the East Indies, and of Belmont in Kent. In 1820 he was made a Grand Cross of the Bath, and in 1824 appointed governor of Dumbarton Castle. He died in 1829.

HARRISON, GENERAL WILLIAM HENRY, President of the United States, whose name ranks high among the soldiers and statesmen of the western hemisphere, was born in Virginia, in 1773; and received the rudiments of his education at Hampden Sydney College. He was originally intended for the medical profession; but in 1791 he entered the army as an ensign in the United States artillery. He afterwards distinguished himself in the campaigns against the Indians of the northern frontiers, who for some time had carried on a most barbarous system of warfare. Under the leadership of Tecumseh, these Indians had created the most alarming disturbances, often attended with the greatest cruelties. During the years 1811, 1812, and 1813, Harrison, who had attained the rank of general, commanded a body of volunteers and militia, who were engaged in many hostile conflicts with these Indians, and at length succeeded in reducing them to subjection. General Harrison was afterwards commissioned by the President of America to negotiate with those enemies whom his military prowess had subdued. In 1828 he received the appointment of minister to the State of Columbia; and so high an opinion did his fellow-citizens entertain of his diplomatic talents, that in 1840 he was elected President of the United States; but he did not long survive the honour conferred upon him, for he died in April of the following year, 1841.

HARROWBY, RIGHT HON. DUDLEY RYDER, EARL OF, was born in London, in 1762; and few men have occupied more important stations in the great political arena of his country. At the age of twenty-two, young Ryder represented the family borough of Tiverton in the House of Commons; and the first office conferred upon him was that of Under-Secretary of State for Foreign Affairs. Under the ministry of Pitt, in 1791, he was appointed Paymaster of the Forces, and Vice-President of the Board of Trade; and in 1800 he received the treasurership of the navy. In 1804, having been called to the House of Peers on the death of his father, he was entrusted with the seals of the Foreign Office; and shortly afterwards was appointed Chancellor of the Duchy of Lancaster; both of which offices he soon resigned, but still retaining his seat in the cabinet. In 1809, in consideration of his political services, he was raised to the dignity of an earl by the titles of Earl of Harrowby and Viscount Sandon. In the course of the following year his lordship published a well-written pamphlet on the necessity of augmenting the poorer church benefices, the result of which was a grant of 100,000*l.* for the relief of the poorer clergy. He also obtained the passing of an Act for the better support of stipendiary curates; and it is generally considered that this 'Curates Act,' which is known by his lordship's name, has tended more than any other statute of modern times to raise the character of the church. On the formation of the Liverpool ministry, the dignified office of President of the Council was conferred upon his lordship. In 1819 a committee of the Lords was formed, to investigate the state of the currency, and the noble earl was placed at its head. The report which he then prepared was considered a very important document, and has often, since that period, been referred to as a work of considerable authority. It was at the mansion of his lordship, in 1820, that the assassination of the ministry, by the Cato-street gang, was to have taken place; and it was, in a great degree, owing to the prudent measures of the earl that the atrocious intention was defeated, and the conspirators brought to justice. In 1827 his lordship retired from the service of the Crown, and soon afterwards withdrew altogether from public life. He died in 1848.

HARVEST SPIDER (Lat. *phalangium*), a genus of the *Phalangidæ*), belonging to the family of the tracheal Arachnidæ, in which the head, thorax, and abdomen are united, and the legs exceedingly long and slender. The tarsi often consist of more than fifty joints. The antennæ of the jaws are large, and furnished with a didactyle claw.

These insects are extremely voracious; and,

supported on their stilt-like limbs, they stalk about among plants, in our gardens and fields, in search of insect prey. Some forms, belonging

HARVEST SPIDER.

to the same family, are remarkable for the shape of their abdomens, which project into spines and angles of every description.

HARWOOD, REV. DR. THOMAS, perpetual curate of Hammerwich and Burntwood, and a learned scholar and divine, was born at Sheperton, Middlesex, in 1767. He was educated at Eton, and afterwards graduated as B.D. and D.D. at Emmanuel College, Cambridge. In Oct. 1791 he was elected head-master of the Grammar School at Lichfield. In 1800 he was appointed perpetual curate of Hammerwich; and in 1828 presented to the chapelry of Burntwood, near Lichfield. He was the author of various works, chiefly of a classical or theological character. In 1789 he published 'Annotations upon Genesis;' in 1794, two volumes of sermons; in 1797, 'Alumni Etonenses;' in 1798, 'The Sacred History of the Life of Jesus Christ, illustrative of the Harmony of the Four Evangelists;' in 1801, 'Grecian Antiquities;' in 1804, 'A Manual of Geography,' and 'The History of Lichfield;' in 1819, an edition of 'Erdeswick's Staffordshire;' and in 1826, 'Annotations upon the Liturgy.' To his various studies he devoted a long and industrious life; and independently of the works which he laid before the world, he has left a large collection of interesting criticisms connected with topography, antiquities, and general history. He died in 1843.

HASTINGS, FRANCIS RAWDON, EARL OF MOIRA, and MARQUIS OF, was born in Ireland in 1754. On the breaking out of the American war, his lordship entered enthusiastically into the ranks of the British army; and in 1775 embarked for the scene of action. In 1778 he was nominated adjutant-general to the British army in America, with the rank of lieutenant-colonel. Here he was engaged in most of the desperate combats, which have been recorded in the history of that unfortunate struggle,—as the battles of Bunker's Hill, of Camden, Hobkirk Hill, &c. On his return to England he was created a British peer, and soon afterwards despatched to Holland with 10,000 men to aid his Royal Highness the Duke of York. In 1803 his lordship was appointed commander of the forces in North Britain. Shortly afterwards he received the important office of governor-general of Bengal, and at the same time he was appointed commander-in-chief of the army in the East Indies, which he held until 1822. His next appointment, after his return to England, was as governor of Malta, in which situation he died in 1826.

No governor-general ever held power in India for so long a time, or with more wisdom, energy, and moderation. In his civil administration he was tolerant to the prejudices of the natives, and favourable to the advancement of knowledge. Under his rule and directions the formidable contests with the Mahrattas, the Pindarees, the Nepaulese, and other hostile foes, were brought to a favourable conclusion, and the subjugation of our Indian territories consolidated.

HATTEMISTS, a fanatical sect of Dutch Calvinists, who flourished in the province of New Zealand, in the 17th century, and were so called from Pontian Van Hattem. He maintained the system of a fatal and uncontrollable necessity, and held that mankind were under no kind of obligation to obey the divine laws.

HAUSMANITE, a mineral found in the Hartz Mountains, near Ihlefeld, which crystallizes in octahedrons. Its colour is of a brownish black, with an imperfect metallic lustre. Its specific gravity is 4·8.

HAVELOCK, GENERAL SIR HENRY, an illustrious soldier, whose skill and bravery nobly retrieved English honour in British India, was born in the parish of Bishopwearmouth, co. Durham, in 1796. He was educated at the Charterhouse School, and in 1813 was entered of the Middle Temple, where his most intimate associate was the late Judge Talfourd, author of 'Ion.' His elder brother, Lieut.-Col. Wm. Havelock, having distinguished himself in the Peninsular war and at Waterloo, he became in turn inspired with the military ardour of his family. A month after the battle of Waterloo he was appointed, by purchase, second lieutenant to the Rifle Brigade; and he had the good fortune, in his military training, to have the assistance of Captain, afterwards Sir H. Smith, the hero of Aliwal. Having subsequently exchanged into the 13th Light Infantry, in 1823 Havelock departed for India; and in the Burmese war, which broke out in 1824, he was appointed deputy-assistant-adjutant-general. He was present at the actions of Napadee, Patangoh, and Peghan. Being an accomplished scholar and a linguist, our hero, in 1827, published the 'History of the Ava Campaigns,' which was remarkable for the freedom of its comments on the circumstances of the war. Notwithstanding the talents he everywhere exhibited, and the learning he displayed on his passing for languages at the college of Calcutta, he remained for twenty-three years a subaltern. About this period, an army was collected for the invasion of Affghanistan. Havelock accompanied the British forces, and was present at the capture of Ghuznee and Cabul. He afterwards published a 'Narrative of the Affghan Campaign,' which was highly appreciated for its style and fidelity. On the second invasion of Affghanistan, Havelock was sent to join Sir R. Sale, at Jellalabad, and was present at the various encounters with the Ghilzies. He had also the

chief direction, under General Sale, of the memorable defence of that place, of which he wrote the despatches, so highly commended by Sir G. Murray. In the crowning attack upon the forces of Akbar Khan, and their final defeat, Havelock commanded the right column, and broke the enemy's lines before the main forces of the British could enter into action. For this gallant deed he was made a Companion of the Bath, and gazetted to a brevet-majority.

In the sixth volume of Thornton's 'British India,' the writer there makes honourable mention of this memorable affair. The attacking British forces consisted of three columns of infantry, the right column mustering only 360 men; being under the command of Captain Havelock. 'The troops issued from the Kabool and Peshawur gates early in the morning, and found the whole forces of the enemy, amounting to about six thousand, formed in order of battle for the defence of the camp; their right resting on a fort, and their left on the Kabool River. Some ruined works, recently repaired, were filled with Affghan marksmen, ready to pour forth a fatally-directed fire. The attack was led by skirmishes and column under Captain Havelock, by whom the extreme left of the enemy's line was pierced. The Affghans made repeated attempts to check the advance by a sharp fire of musketry, by throwing forward heavy bodies of horse which twice threatened in force the detachments of foot under Captain Havelock. The artillery, however, advanced at a gallop, and directed a heavy fire on the enemy's centre, while two of the columns of infantry penetrated his line near the same point, and the third forced back his left from its support on the river, driving into it some both of horse and foot. In a very short time the foe was dislodged from every part of his position, his guns captured, his camp involved in flames, and Akbar Khan, with his discomfited army, in full retreat towards Lughman.'

The following year Sir Henry Havelock was promoted to a regimental majority, and nominated interpreter of the Persian language to the commander-in-chief, Sir Henry Gough. In 1844 he was promoted to the rank of lieutenant-colonel, by brevet. In 1845 he was actively engaged in the war against the Seiks, and took a conspicuous part in the battles of Moodkee, Ferozeshah, and Sobraon, in which he had three horses shot under him. He was afterwards appointed deputy-adjutant-general of the Queen's troops at Bombay; but twenty-five years of ever active service beginning to make an impression on his constitution, he visited Europe for the renovation of his health. On his return to Bombay, in 1851, he was made brevet-colonel, and appointed, through the interest of Lord Hardinge, quarter-master-general, and the adjutant-general of the Queen's troops in India. During the short war with Persia, Sir Henry had the command of the second division, and was engaged at the action of Mohammerah. In the mean time the sanguinary rebellion of the Indian Sepoys had broken out, and Havelock, on his return from the Persian campaign, was sent up to Allahabad as brigadier-general, when he was frequently engaged with the overwhelming forces of the sanguinary rebel Nana Sahib. He defeated his formidable enemy in nine pitched battles, took about 100 pieces of cannon, recaptured Cawnpore, and rescued Lucknow and its brave defenders from the impending horrors that had been perpetrated at Delhi and Cawnpore. But at length, worn out by unceasing toil and constant exposure, he was seized with a mortal disease, and expired at Lucknow, on the 25th of November, 1857.

HAYDN, JOSEPH, compiler of the 'Dictionary of Dates,' which has passed through numerous editions, and still maintains its reputation as a useful work of reference. He was also the author of 'The Book of Dignities, containing Rolls of official Personages of the British Empire,' &c. It was a sort of Beatson's Political Index modernized. Mr. Haydn likewise edited the last edition of Lewis's Topographical Dictionaries. He died in 1856; and a short time before his death the government assigned him a small pension of 25*l.* per annum, which is still continued to his widow.

HEAD, SIR GEORGE, Deputy-Knight Marshal to her Majesty, was born at Higham, in Kent, in 1782, and is known as the author of various works of some literary repute; among others, his account of 'Forest Scenery and Incidents in the Wilds of North America, being a Diary of a Winter's Route from Halifax to the Canadas, during Five Months' Residence in the Woods, and the Borders of Lakes Huron and Simese.' Sir George had been engaged to superintend the commissariat duties of the British settlement in North America for many years; and while on the Halifax station, engaged in that capacity, the above Diary was made, and published in 1829. Encouraged by the success which accompanied this work, he brought out his 'Home Tour through the Manufacturing Districts of England in the Summer of 1835;' his 'Home Tour through various Parts of the United Kingdom;' 'Memoirs of an Assistant Commissary General;' and 'Rome, a Tour of Many Days.' He was also the translator of Cardinal Pacca's 'Historical Memoirs,' and the 'Metamorphoses of Apuleius,' which were published in 1850 and 1851. He was likewise an extensive contributor to the pages of the 'Quarterly Review;' while his brother, Sir Francis Head, was the author of a very popular work known as the 'Bubbles of Nassau.' Sir George received the honour of Knighthood in 1831; and died in 1855.

HEAD'BOROW, a term applied by the Saxons to the head of the frank-pledge in boroughs. He was the chief of the ten pledges, as the other nine, being inferior pledges, were designated *hand-borows*.

HECATE'SIA, a festival celebrated by the Greeks, and more especially by the Athenians, in honour of Hecate. The numerous statues erected in honour of this goddess were termed *Hecatæa*.

HEC'ATOMB (Gr. ἑκατὸν a hundred, and βόες oxen), in classical history, a sacrifice offered to the gods on extraordinary occasions, which consisted of one hundred oxen. It is related that Pythagoras offered a Hecatomb to the Muses, on his discovering the important demonstration of the

problem contained in the 47th proposition of the first book of Euclid.

HEC'TARE, the principal land measure of the French, which consists of a square of 100 metres on every side, equal to 2 acres, 1 rood, 35 square poles, and 11¼ square yards English.

HEC'TOLITRE, a measure of capacity in France, containing 100 litres, or 2·75 bushels English. The hectolitre of wheat is equal to 11⅓ pecks.

HELEP'OLIS, a ponderous movable machine, used by the ancients for besieging towns, forts, &c. It consisted of numerous stories, whose dimensions gradually lessened as they ascended. In each compartment were bodies of soldiers, who discharged their missiles through small openings, previous to making the general assault on the besieged place; while the machine was pushed forward on castors by the strongest and most vigorous men of the whole army.

HELIÆ'A, amongst the Athenians, an important court of justice, next in importance to the Areopagus. It was generally composed of 500 members; and sometimes, in important cases, of more. The judges, in awarding their verdict, made use of black and white beans, which were cast into two distinct urns, and the suffrages numbered before a presiding magistrate, the majority of white beans being equivalent to an acquittal.

HE'LIOSTAT (Gr. ἥλιος the sun), a scientific instrument for reflecting at a distant station an image of the sun into the telescope of a theodolite. A train of clock-work so rotates the mirror that, on being once adjusted, it follows the motion of the sun.

HE'LIOTROPE (Gr. ἥλιος the sun, and τρέφω to turn), a silicious mineral of a deep green colour, and sometimes variegated with blood-red spots, whence it is known as the Bloodstone.

HELOS'TOMA, a genus of fishes, of the family *Spirobranchidæ*, with ovate bodies, the ventral fins rounded, and the mouth small, and very retractile.

HELO'TES, a genus of fishes, of the family *Percidæ*, with fusiform body, small mouth, and obtuse snout.

HEMEROBAP'TISTS (Gr. ἡμέρα a day, and βάπτω to wash), an ancient Jewish sect, mentioned by Epiphanius, who were so called from their washing and bathing every day in all seasons. Like the Sadducees they denied the resurrection of the dead; but in other points they held nearly the same opinions as the Scribes and Pharisees.

HEMEROCAL'LEÆ (Gr. ἡμέρα a day, and καλὸς beautiful), a tribe of *Liliaceæ*, or Day-lilies, with campulate corollas, and assimilating, in many respects, to the *Tulipeæ*, or Tulips.

HEMICAR'DIUM (Gr. ἡμι half, and καρδία heart); a subgenus of Mollusca, of the family *Tellinidæ*, and sub-family *Venerinæ*. The shell is half heart-shaped (whence its name), and the anterior side abruptly truncated.

[The Greek particle *Hemi* (half) is very generally used as a prefix in the composition of words connected with natural science, and is usually found expressive of the form or nature of the object to be described; as *Hemicircus* (half-hawk), a genus of birds of the horned owl kind, and of the family Strigidæ;—*Hemicycla* (half-round), a genus of Helicinæ; or land-snails, with a discoid shell, and four whorls;—*Hemidactylos* (half-fingered), a genus of Saurian reptiles, of the family Iguanidæ, and belonging to the flat-toed lizards;—*Hemidon* (half-toothed), a genus of Mollusca, of the family Unionidæ, and belonging to the Anadonts, in which the shell is ovate;—*Hemifusus* (half-spindle), a genus of Mollusca of the family Turbinellidæ, and belonging to the Fusinæ, or Spindle shells, in which the shell is unequal or half-fusiform;—*Hemilepidotus* (half-scaled), a genus of fishes of the family Cottidæ;—*Hemilophus* (half-crested), a genus of birds, of the family Picidæ, and belonging to the Picinæ, or Woodpeckers;—*Hemionite* (a mule, or half ass), a genus of Ferns, of the order Polypodiaceæ;—*Hemipeplus* (half-veiled), a genus of coleopterous insects, of the family *Melasoma*;—*Hemipodius* (half-footed), a genus of birds of the Grouse kind, and of the family Tetronidæ;—*Hemirhamphus* (half-snouted), a genus of fishes of the family Salmonidæ, and belonging to the Flying fishes, in which the upper jaw is long, and the lower one short;—*Hemisinus* (half-channelled), a genus of Mollusca, of the family Turbidæ;—*Hemisphere* (half a globe), in astronomy and geography, one half of the mundane sphere, the equator dividing it (north and south) into two equal parts;—*Hemitrochus* (half-topped), a genus of Mollusca, the shells of which have convex whorls and conic spires.]

HEPAT'IC (Gr. ἧπαρ the liver), a term of very general use in anatomy and medicine, as applied to the liver, and its various functions and affections; as the *hepatic duct*, and the *hepatic artery*, situated between the lobes of the liver;—*Hepatic vein*, the vein within the liver;—*Hepatic plexus*, a kind of convoluta connected with the vena portæ and the hepatic vessels;—*Hepatic glands*, which receive the absorbents of the liver. The *Hepatic flux* is an over-abundant discharge of bilious secretion. The term is also frequently applied to mineralogical objects, from their resemblance to the dark blood-red colour of the liver; as *Hepatic pyrites*, or *hepatic sulphuret of iron*, a variety of prismatic iron pyrites, which, on exposure to the weather, receives a brown tarnish, and through oxidation becomes finally decomposed. *Hepatic cinnabar* is a dark-coloured variety of cinnabar, and the Mercure Sulphur of Hauy.

HEP'TACHORD (Gr. ἑπτὰ and χορδαὶ, seven chords), a system of seven musical sounds, which, among the classical ancients, implied two conjunct tetrachords. The interval of the Heptachord was equivalent to our seventh. In ancient poetry the word signified certain verses that were sung to the music of seven chords; that is, seven different tones or notes. In this sense the term was generally applied to the lyre, when it had but seven strings.

HERAT (i. 241, AFFGHANISTAN). Since our account of this important frontier of the Affghan territories, the city has experienced some of those evils of war, to which, in its early career, it has been so frequently exposed. In 1856 the Shah of

Persia laid siege to the place, in direct contravention of a treaty with Great Britain; and eventually succeeded in effecting its capture, after many sanguinary conflicts. This led to a declaration of war on the part of England against the Shah of Persia. A large naval and military force was sent up the Persian Gulf, which effected the capture of Bushire, and other places. After the Persian troops had sustained some signal defeats, his Persian Majesty assented to the evacuation of Herat, and its restoration to the Affghans, in whose possession it still remains.

HERBERT, HON. ALGERNON, barrister-at-law, and sixth son of Henry first Earl of Carnarvon, was born in 1792, and educated at Eton. He passed through the university honours at Oxford with distinguished *éclât;* and was called to the bar in 1818. He was a man of extraordinary learning, and may be considered as the first and most original writer of the day in that peculiar line of antiquarian research in which he engaged. His first work was printed anonymously, under the title of 'Nimrod, or a Discourse upon certain Passages of History and Fable.' It was republished in two volumes in 1828; and succeeded by a third and fourth, which contained many erudite articles on a variety of subjects; such as Roma, Antichrist, Apocrypha, Cosmogonia, Paradise, the Deluge, Ammon, Alchymus, &c. Mr. Herbert afterwards published, in two thin quarto volumes (1836 and 1841), a work entitled 'Britannia after the Romans; being an attempt to illustrate the religious and political revolutions of that Province in the Fifth and succeeding centuries.' This was followed by an 'Essay on the 'Neo-Druidic Heresy;' 'Nennius, the Irish version of the Historia Britonum' (1848); and 'Cyclops Christianos, an Argument to disprove the supposed Antiquity of Stonehenge and other Megalithic Erections in England and Britanny' (1849). He died in 1855.

HEREFORDSHIRE (vii. 133-7). According to the census of 1851, the entire population of the county was 115,489, of which 58,114 were males, and 57,375 females. Of houses, inhabited and uninhabited, there were 25,080. The area of the county was computed at 836 square miles, or 534,823 acres, comprehending 138 persons to each square mile. The population of the principal parishes and towns was as follows:—

All Saints	3,172	Leominster, mun. and par.	5,214
Bromyard	3,093	Ross Foreign	1,343
Hereford, mun. and par.	12,108	Ross Borough	2,674
Kington	2,871	Walford	1,217
Ledbury	3,027		

HERETICO COMBURENDO, in the Middle age, a writ issued against a heretic, by which he was condemned to be burnt alive.

HER'ISON, in military matters, a sort of chevaux-de-frise made of one strong beam, with a number of iron spikes which revolve upon a pivot, and always present themselves in front, whichever way the beam revolves.

HERPES'TES (Gr. ἕρπω to creep), a genus of carnivorous animals, of the Weasel kind, of the family *Mustellidæ*.

HER'PETON (Gr. a reptile), a genus of Water-snakes, of the family *Hydrophidæ*, in which the crown is covered with plates, and the head furnished with two scaly tentacula.

HER'RERITE, a mineral found at Albarradon, in Mexico, and so called in honour of Herrera, who first analysed it. It is discovered in masses of a grass-green colour, and vitreous in lustre. Its constituents are—tellurium, 55·58; carbonic acid, 31·86; peroxide of nickel, 12·32.

HERRIES, RT. HON. J. C., an eminent financier and political economist, was born in 1778. He received his education at the University of Leipsic; and in 1798 became a junior clerk in the Treasury. Without family connections or fortune, he had to depend on his own merit and exertions for success. During the administrations of Mr. Vansittart and Mr. Percival, he discharged the duties of private secretary from 1807 to 1811. During the latter year he was made Comptroller of Army Accounts, and soon afterwards was appointed to the office of Commissary-in-Chief, which, during the war, was a place of great trust and importance. In 1822, after contributing materially to the financial reform of the civil list, and to a complete alteration in the constitution and practice of the Customs and Excise Departments, Mr. Herries entered political life by accepting the office of Secretary of the Treasury, when he was soon afterwards elected member for the borough of Harwich, which he continued to represent until 1841. In 1827 he became Chancellor of the Exchequer under Lord Goderich's administration, and in 1828 he was appointed Master of the Mint and President of the Board of Trade. In 1841 Mr. Herries unsuccessfully contested the borough of Ipswich, and remained out of office during the next six years, when he was returned for Stamford. During Lord Derby's administration he held office as President of the India Board; but on the termination of his lordship's ministry, the right hon. gentleman finally retired from Parliament, to pass the rest of his days in domestic ease.

Amidst his many active duties, Mr. Herries was not inattentive to literature and the arts, and he was well acquainted with the ancient and modern languages of Europe. In early life he published a translation from the German work of Frederick Gentz, on the state of Europe before and after the French Revolution, which excited much attention at the time; and a second edition made its appearance in 1802. His death took place in April 1855.

HERSCHEL, MISS CAROLINE LUCRETIA, sister to the great astronomer of that name, and sole assistant of his astronomical researches, was born in Hanover, in 1750. So highly were her scientific labours, in connection with her brother's abstruse calculations, appreciated by his Majesty George the Third, that he was graciously pleased to grant her a salary sufficient for her moderate requirements. Not only did she execute the whole of the extensive and laborious numerical calculations necessary to render her brother's researches available to

science, but she found time, at intervals, both for actual astronomical observations of her own, and for the execution of more than one work of great utility and extent. With a Newtonian sweeper, constructed by her brother, she was in the habit of searching the heavens for comets, and that so effectively as to be rewarded with eight different discoveries from August 1786 to August 1797. Her claim to the first discovery of five of them was admitted by the scientific world. During these sweeps of the heavens, Miss Herschel also discovered several remarkable nebulæ and clusters of stars which had never before been observed, and which are recorded in Sir Wm. Herschel's catalogue. Among her astronomical works, which she found time to execute at intervals of leisure, were—1st, 'A Catalogue of 561 Stars observed by Flamsteed;'—2nd, 'A General Index of Reference to every Observation of every Star inserted in the British Catalogue;'—3rd, 'A Zone Catalogue,' comprehending all the nebulæ and clusters of stars observed by her brother in his sweeps; for which she received the gold medal of the Astronomical Society of London, and was elected an honorary member. On the death of her brother, in 1822, she left England, where she had resided for about half a century, and returned to her native place, which she never again quitted;—passing the last twenty years of her life in repose, and respected by all who knew her. She died in 1848, in her 98th year.

HERSCHELITE, a mineral which occurs in six-sided prisms, and so called in honour of Sir Wm. Herschel. In colour it is translucent, white, or opaque. It consists of potash, silica, and alumina; and its specific gravity is 2·11.

HERSE (Fr. *herse*), in the Middle age, a kind of machine used in fortification, which consisted of a series of spikes projecting from transverse pieces of wood. It was sometimes used as a portcullis, to serve as an interior protection, after the outer-gate had been forced by the enemy.

HERTFORDSHIRE (vii. 162–8). According to the census of 1851, the entire population of the county was 167,298; of which 82,831 were males, and 84,467 females. Of houses, inhabited and uninhabited, there were 33,761. The area of the county was computed at 611 square miles, or 391,141 acres; comprehending 274 persons to each square mile. The population of the principal parishes and towns was as follows:—

Abbots Langley	2384	Great Berkhampstead	2943
Aldenham	1656	Harpenden	1980
Baldock	1920	Hatfield	2727
Barnet	2380	Hemel Hampstead	2727
Berkhampstead	2943	Hertford	6605
Bishop's Hatfield	3862	Hitchen	5258
Bishop's Stortford	5280	Hoddesdon	1854
Broxbourne	2571	Kings Langley	1599
Bushey	2750	Redbourn	2085
Caddington	1866	Rickmansworth	4851
Cashio and Leavesdon	2026	Royston	1529
Cheshunt	5579	Sawbridgeworth	2571
Chipping Barnett	2380	Standon	2462
Flamstead	1852	Stevenage	2118
Great Amwell	1652	St. Albans	7000
St. Stephen	1802	Watford	3800
Tring	3218	Welwyn	1557
Ware	4882	Wheathampstead	1908

HERZEGOVINA, an extensive tract of country situated on the eastern shores of the Adriatic, generally known as Turkish Dalmatia, has of late years assumed some geographical importance from the successful resistance of the Montenegrins to Turkish domination, of which Herzegovina formed the centre and starting point. It lies between lat. 43° and 44° 20′ N. The southern and larger portion belongs to Turkey, and the remainder to Austria. It is bounded N.E. by Croatia and Bosnia, S. by Montenegro and Albania, and W. by Dalmatia and Cattaro. Herzegovina formerly belonged to Croatia, when that kingdom was independent; but in 1326 it was incorporated with Bosnia. Under the Emperor Frederick III. it became an independent duchy; but after many protracted contests with the Ottoman arms, it was finally ceded to Turkey by the peace of Carlovicz, in 1697. The Porte once more incorporated it with Bosnia, and it has been retained by that power for the last two centuries. The extent of Bosnia, including Herzegovina, is estimated at 900 square leagues; and, according to a census taken in 1848, the population was roughly estimated at 1,400,000. The Bosniaks form about a third of the population; the Croats are estimated at 180,000; and the Morlachs at 150,000; the latter being concentrated at Herzegovina, and famed as the most determined adversaries of the Turks. All these different peoples belong to the ancient Sclavonic race. They chiefly follow the Greek Church, and have a thorough detestation and contempt for the Turkish rule.

HETMAN, a title given to the chief general of the old Polish armies; and now applied, by the czar of Russia, to the chief general of his Cossack forces.

HIDAGE, among our Anglo-Saxon ancestors, an extraordinary tax payable on every hide of land. Thus when the Danes invaded England, in 994, King Ethelred levied a tax by hides on all his lands, in order to enable the inhabitants to arm in defence of the kingdom. From every 310 hides sufficient was then raised, in provisions, money, and materials, to furnish one ship.

HIEROGRAM'MATISTS, among the ancient Egyptians certain priests who presided over religion and learning. Their especial duties were to expound religious mysteries, and preserve the history and hieroglyphics of the land.

HIEROPHAN'TES, a name applied to the high priests of the Eleusinian mysteries, who for many ages were chosen from the family of the Eumolpidæ. The term was also applied to the priests or priestesses who had the care of the sacrifices and sacred things.

HIGH-PLACES, a term frequently mentioned in Scripture history as applying to certain elevated places or eminences, where the idolatrous ceremonies of the Assyrians, Phœnicians, and other early Asiatics were performed; and where the use of religious temples was deemed irreligious and unlawful.

HILARO'DI (Gr. ἱλαρόω to exhilarate, from

ἱλαρὸς cheerful, and ᾠδὴ a song), among the early Greeks a kind of itinerant poet-musicians, who went about reciting or singing little amusing poems or songs, generally accompanied with some instrument. They were not unlike the wandering bards of our early history. Their dress was white, and their heads were usually crowned with golden fillets. In the course of time they were introduced on the regular stage.

HILL, GENERAL LORD ROWLAND, whose brilliant military services have never been surpassed, was born in 1772. He was the second son of Sir John Hill, Bart., of Houlstone, co. Salop. His first commission in the army was as an ensign in the 38th regiment. On his raising an independent company, in 1792, he acquired the rank of captain. At Toulon he was employed as aide-de-camp to the successive generals commanding there; and it was here that he first attracted the notice of Sir James Graham, through whose interest he obtained a majority in the 90th, which was soon followed by his promotion to a lieutenant-colonelcy in the same regiment. He was for some time engaged in the memorable campaign in Egypt. In 1808 he embarked with his regiment for the Peninsula, where he distinguished himself in many hard-fought contests with the legions of France. He was in the battles of Roleia and Vimiera, and at the passage of the Douro, where, as general, he was the first in command. He was at the siege of Badajoz, and at the battles of Talavera, Salamanca, Vittoria, Nivelle, Orthez, and Toulouse; in all of which he exhibited the most consummate skill and bravery. After the battle of Talavera, in which he had taken so distinguished a part, he was appointed colonel of the 49th regiment, created a Knight of the Bath, and made governor of Blackness Castle. On the suspension of hostilities between England and France, in 1814, Sir Rowland was elevated to the peerage, by the title of Lord Hill of Almaraz. On the retirement of the Duke of Wellington from the administration of the affairs of the country, and from the command of the British army, Lord Hill was appointed to its head, and administered all the duties of the Horse-Guards with a degree of skill and regularity worthy of his previous career. He died in 1843.

HILL, REV. ROWLAND, the benevolent but eccentric minister of Surrey Chapel, in Blackfriars Road, London, was born at Hawkstone, near Shrewsbury, in 1774. He was originally intended for the church; but on quitting the university he became fascinated with the doctrines and the preaching of the celebrated George Whitefield, who was then in the zenith of his popularity. He became one of his most zealous disciples, and adopted the life of an itinerant preacher, but still resuming at given periods his clerical duties at the London and Bristol tabernacles. His admirers and supporters soon undertook to erect a religious edifice worthy of his rising fame; and in 1783 the fine circular building, known as the Surrey Chapel, was completed. There he continued to officiate to crowded audiences, during the winter months, until the time of his death,—a period of fifty years. The eccentricity of his discourses, and manner of delivering them, attracted universal interest. He wrote and published a variety of little brochures, generally of a moral or religious tendency; among others, 'Village Dialogues,' and 'Spiritual Characteristics;' the latter of which was a satirical pamphlet against the ministers of the Established Church, in which he indulged in his natural vein of sarcasm and broad humour. With all his eccentricities, however, Rowland Hill may be characterized as a truly benevolent and kind-hearted Christian; and many gratifying anecdotes are on record of his charitable disposition. He died in 1833, aged 88.

HINDUSTAN (vii. 191–232). Since the publication of our account of this immense empire, many important events have transpired, and some vast accessions of territory been made, which may be briefly noticed in chronological order.

In 1849, the Sikhs, who had engaged in a formidable struggle with the British power, were entirely overthrown by General Lord Gough, at the great battle of Goojerat, when the extensive country of the Punjaub was annexed to the British territories. In 1850 Sir Charles Napier, who had been appointed commander-in-chief in India, disbanded the 66th Bengal Native Infantry for mutiny. In 1851 and 1852 the Anglo-Indian forces were engaged in hostilities with the Birman empire. After the storming and capture of Martaban, Rangoon, Pegu, and Prome, the Birmese were compelled to submit to terms, and the province of Pegu, which formed a portion of the Birman empire, was annexed to the British possessions. On the death of the Rajah of Nagpore, in December, 1853, his territories were added to the British dominions. In 1855 Dost Mahomed, by treaty with the British, was re-instated on the throne of Cabul. In 1856, the deposition of the King of Oude, on account of a long series of misgovernment and oppression, was effected, when his kingdom was annexed to our Indian possessions. During the same year, Viscount Canning assumed the governor-generalship in India, in the place of Lord Dalhousie. Thus, in addition to the extensive regions of the Scinde and the Punjaub, the following territories, since 1851, have been added to the British crown:—Pegu, 32,250 square miles; from Meer Ali Moorad, 5412; from Toola Ram Senaputtee, 2160; Odripore, 2306; Nagpore, 76,432; Thansi, 2532; Roodwal (extent not known); and Oude, 25,000.

In 1857 a general mutiny, of an extensive and sanguinary character, broke out, among the native troops, in the presidency of Bengal. It first commenced in single regiments at Barrackpoor, Berhampoor, and Lucknow, which were, however, readily subdued; but at Meerut the 3rd regiment of Bengal cavalry was joined in open mutiny by the 11th and 20th regiments of native infantry. After perpetrating the most sanguinary atrocities they marched to Delhi; and their numbers having materially increased, they took possession of that ancient city, and proclaimed the old deposed king as Emperor of Hindustan. Mutinies then broke out in various places, which materially contributed to the strength

of the rebels at Delhi; so that the native army of Bengal, as far as the East India Company were concerned, had ceased to exist. At Cawnpore and Lucknow the mutinies were of a sanguinary character; and at the former place, as well as at Delhi, the most fiendlike atrocities were committed on many women and children. [CAWNPORE, DELHI, and LUCKNOW, *Supplt.*] The small force at Cawnpore, on the death of Sir Hugh Wheeler, were induced to surrender by capitulation to Nana Sahib, the chief of the mutineers; but they were afterwards nearly all treacherously murdered. General Havelock then marched from Allahabad to Cawnpore with a force of 1000 Europeans and 300 Sikhs, defeated the rebels, and recaptured the city. With very inadequate forces he beat the rebels, between Cawnpore and Lucknow, in nine pitched battles; and eventually succeeded, in conjunction with General Outram, in relieving the small force of Europeans who were there besieged; but owing to the overwhelming numbers of the enemy he was unable to force his way back, until Sir Colin Campbell, who had been appointed commander-in-chief, and had opportunely arrived at the Residency, signally defeated the mutineers, and extricated the women and children from their perilous situation. But here the army had to lament the loss of the heroic Havelock, who shortly afterwards died of dysentery brought on by anxiety and fatigue. (HAVELOCK, *Supplt.*) In the meantime Delhi was closely besieged by the British troops under Generals Wilson and Nicholson; and on the 20th of September, after six days' continuous fighting, it was taken by storm. The king himself was captured, tried, and convicted, and afterwards expatriated. In December of the same year, the Gwalior contingent force, having overwhelmed the troops under General Windham, obtained possession of Cawnpore; but on the arrival of Sir Colin Campbell the sepoys were promptly defeated, and eventually destroyed or dispersed by General Hope Grant. During the year 1858 there were many severe contests with the mutineers; but happily the enemy were everywhere defeated; and Sir Colin Campbell, for his skill and bravery, was elevated to the peerage under the title of Lord Clyde.

The native army of India, in which the East Indian government has been so miserably deceived, usually amounted to about 240,000 infantry, and 26,000 cavalry. It attained by degrees the strength and discipline which it has exhibited in this sanguinary rebellion. A few sepoy battalions were at first employed merely as an appendage to the Company's forces, with a captain, adjutant, and a few sergeants attached thereto. When opposed to the irregular troops of the native princes, the discipline and skill which they had acquired, rendered them valuable adjuncts; and at length it was thought necessary to raise the sepoy force to a higher degree of efficiency. The number of British officers was gradually increased, and the native corps were more and more assimilated to regiments of the line. At length, feeling conscious of their strength, and being fully aware of their overwhelming numbers, they evidently conceived that, as England was involved in wars with Russia and Persia, the time had arrived when they could effect their independence, and expel the British from the Indian soil. Indeed it does not appear that there was the least cause for dissatisfaction, or any complaint against the British rule, when the rebellion first broke out—if, perhaps, we except the unceremonious seizure of the kingdom of Oude from its unworthy sovereign [OUDE.] In fact there is every reason to believe that the conspiracy, no doubt instigated by the Mohammedans and native princes, had been concocting for years; but the misplaced confidence and overweening indulgence of the Company's servants, prevented the treason being detected. Of the bigoted, treacherous, and sanguinary character of the natives of India, the illustrious Duke of Wellington was well aware; and he has thus recorded his opinion:—'The natives, as far as I have observed, are much misrepresented. They are the most mischievous, deceitful race of people I have seen or read of. I have not yet met with a Hindoo who had one good quality, even for the state of society in his own country, and the Mussulmans are worse than they are. Their reputed meekness and mildness do not exist. It is true that the feats which have been performed by Europeans have made them objects of fear; but wherever the disproportion of numbers is greater than usual they uniformly destroy them if they can; and in their dealings and conduct among themselves they are the most atrociously cruel people I ever heard of.'—The truth of these remarks has been wofully verified by recent events.

The following presents a synoptical view of the extent, population, revenues, and expenditure, of the British and Native States of this mighty empire, according to the returns lately issued from the Statistical office of the East India House, and other official sources of information:—

British States.

Under the Direct Administration of the Governor-General and Council.—Punjaub, extent of area, 73,535 square miles; with a population of 10,435,710. Cis-Sutlej States (including Umballah, Thaeysur, Loodiana, and Ferozepore), 8090 square miles; population, 2,282,111. Oude, 25,000 square miles; population, 5,000,000. Nagpore or Berar, 76,432 square miles; population, 4,650,000. Pegu, 32,250 square miles; population, 570,180. Tenasserim provinces, 29,168 square miles; population, 115,431. Eastern Straits settlements (including Penang provinces, Wellesley, Singapore, and Malacca), 1575 square miles; population, 202,540. Total under direct administration of the Governor-General and Council, 246,050 square miles, and 23,255,972 of population.

Bengal. Under the Administration of the Lieutenant-Governor of Bengal.—Patna, 18,319 square miles; population, 7,000,000. Bhaugupore, 28,329 square miles; population, 8,431,000. Moorshedabad, 15,950 square miles; population, 6,815,876. Dacca, 20,942 square miles; population, 4,055,800. Jessore, 15,862 square miles; population, 5,758,654. Sunderbunds, 6500

square miles; population not known. Chittagong, 7567 square miles; population, 2,406,950. Cuttack, 12,664 square miles; population, 2,793,883.

Non-Regulation Provinces.—Assam, 24,531 square miles; population, 749,835. Cachar, 4000 square miles; population, 60,000. Territory resumed from Toola Ram Senah-puttee, 2160 square miles; population, 5015. South-west frontier territories, 32,895 square miles; population, 2,235,204. Arracan, 32,250 square miles; population, 540,180. Total under the administration of the Lieutenant-Governor of Bengal, 221,969 square miles, and 40,852,397 of population.

North-Western Provinces. Under the Administration of the Lieutenant-Governor of the North-Western Provinces.—Delhi, 8633 square miles; population, 2,195,180. Meerut, 9985 square miles; population, 4,522,165. Rohilcund, 12,428 square miles; population, 5,217,507. Agra, 9298 square miles; population, 4,373,156. Allahabad, 11,971 square miles; population, 4,526,607. Benares, 19,737 square miles; population, 9,437,270.

Non-Regulation Provinces.—Kumaon, including Ghurwall, 6962 square miles; population, 605,910. Jarmsar and Bawar, 579 square miles; population, 24,684. Dhera Dhoon, 673 square miles; population, 32,083. Hhote Hasim, 70 square miles; population, 13,767. Bhutty territory, 3017 square miles; population, 112,974. Jaloun and Jansi, 4405 square miles; population, 376,297. Ajmere, 2029 square miles; population, 224,891. British Mairwarrah, 282 square miles; population, 37,715. Saugur and Nerbudda, 15,388 square miles; population, 1,929,587. British Nimar, 302 square miles; population, 25,400. Total under the administration of the Lieutenant-Governor of the North-Western Provinces, 105,759 square miles, and 33,655,193 of population.

Madras. Under the Administration of the Government of Madras.—Nineteen districts, comprising an area of 119,526 square miles, and 20,120,495 of population. Three non-regulation districts, having an area of 12,564 square miles, and 2,316,802 of population. Total under Madras Government, 132,090 square miles, and 22,437,297 of population.

Bombay. Under the Administration of the Bombay Government.—Thirteen districts, embracing an area of 57,723 square miles, and a population of 9,015,534. Two non-regulation districts—Satarra, with an area of 10,222 square miles, and 1,005,771 of population; and Scinde, with an area of 63,599 square miles, and 1,768,737 of population. Total under the administration of the Bombay Government, 131,544 square miles, and 11,790,042 of population.

Grand Total of British States.—Area, 837,412 square miles; population, 131,990,901.

Native States.

Bengal.—There are 148 native States in this presidency, covering a total area of 515,533 square miles, and possessing a population (estimated) of 38,702,206 souls. The most powerful of these are Golab Singh's dominions in Cashmere, which have an area of 60,000 square miles, and a population of 3,000,000; Gwalior (Scindiah's possession) in Central India, with an area of 33,119 square miles, and a population of 3,228,512; Hyderabad, or the Nizam's dominions in the Deccan, with an area of 95,337 square miles, and 10,666,080 of population; and Nepaul in Northern Bengal, which is 54,500 square miles in extent, and has a population of 1,940,000. Of the rest only four exceed a million in population, while some are as low in point of population as 400.

Madras.—The Madras Presidency includes five native States, having a total area of 51,802 square miles, and a population of 5,213,671. The most powerful of these is Mysore, in Southern India, which has a superficies of 30,886 square miles, and a population of 3,460,696.

Bombay comprises thirty-nine native States, with an area of 60,575 square miles, and a population of 4,460,370. All these States are small, the most powerful being the Hattywar petty chief's territory in Guzerat, which has a population of 1,468,700, and an area of 19,850 square miles; and Cutch in Western India, which is 6764 square miles in extent, and has a population of 500,536.

Grand Total of Native States.—Area, 627,910 square miles; population, 48,376,247.

Grand Total of the Area and Population of British and Native States.—Area, 1,465,322 square miles; population, 180,367,148.

The Bengal Army.—In 1853 the Bengal native army numbered in all 83,946 men. Of these 70,079 were infantry. Of the composition of the cavalry, the returns are silent, but the infantry was thus classified:—Brahmins, 26,893; Rajpoots, 27,335; Hindoos of inferior castes, 15,761; Mahommedans, 12,699; Christians, 1113; Sikhs, 50. The far greater number of recruits for this army were obtained, not from the Company's territories, but from the territories of a foreign prince—from Oude. They were either men in whose families the profession of soldier was hereditary, or young, daring idlers, who preferred the trade of arms to regular industry. They have been and are precisely the same materials as those of which the armies of the East have been composed from time immemorial. Their object in enlisting was to obtain a position which would enable them to gratify their irregular appetites—to lord it over the industrial classes.

In the years 1855-6, the total expense of the military force of all the presidencies of India amounted to 10,974,212*l.*, viz. 6,038,530*l.* for Bengal, 2,801,008*l.* for Madras, and 2,134,674*l.* for Bombay. The total expense of the Royal troops was 744,628*l.*; of the Company's artillery, 586,635*l.*; of the Company's native cavalry, 1,363,248*l.*; and of the infantry, 3,745,857*l.* The veterans cost 124,878*l.*; the medical department, 157,062*l.*; the Ordnance, 191,821*l.*; the Commissariat, 1,725,506*l.*; and the Staff, 1,899,159*l.*

General Revenue and Expenditure.—It appears that in 1853-4 the revenue was 26,510,000*l.*, being 2,044,000*l.* less than the expenditure; in

1854-5 the revenue was 27,312,000*l.*, being 1,707,000*l.* short of the expenditure; in 1855-6 the revenue was 28,891,000*l.*, being 972,000*l.* less than the expenditure; and the estimate for 1856-7 was found to amount to 29,344,000*l.*, and the expenses to 31,326,000*l.*, showing a deficiency of 1,981,000*l.* The principal source of income, the land revenue, had increased from 14,848,000*l.* in 1853-4, to 16,682,000*l.* in 1856-7. The customs had increased, in the same period, from 1,283,000*l.* to 2,029,000*l.*, while the revenue from salt had somewhat decreased, and that from opium remained at nearly the same amount. Under the head of charges, we find from 1853 to 1857, that the direct claims upon the revenue, including charges of collection and cost of salt and opium, had increased from 6,805,000*l.* in 1853, to 7,380,000*l.* in 1857; the civil and political establishments from 1,973,000*l.* to 2,500,000*l.*; the judicial and police charges from 2,307,000*l.* to 2,633,000*l.*; buildings, roads, &c., from 659,000*l.* to 1,216,000*l.*; military charges from 10,168,000*l.* to 10,537,000*l.*; buildings for military purposes, from 292,000*l.* to 615,000*l.*; the Indian navy from 472,000*l.* to 603,000*l.* The interest on debt, on the other hand, had decreased from 2,504,000*l.* in 1853, to 2,162,000*l.* in 1857.

During the last few years India has been making wonderful progress in the arts of civilization, especially as regards canals, irrigation, railways, and the electric telegraph. The canals of the Eastern and Western Jumna are 580 miles in extent; and they are calculated to serve for the irrigation of 2870 square miles of fruitful soil. The Ganges canal, which is navigable, and which was opened in 1854, is 525 miles long, 170 feet broad, and 10 feet deep. In its system of irrigation it comprehends that large tract of country between the Jumna and the Ganges, from Allahabad to Hurdwar. It is calculated that on the completion of all its branches, the canal will be 900 miles long, and be capable, in its course, of irrigating not less than 1,470,000 acres of land. The cost, at the beginning of 1857, was 1,400,000*l.*; and the entire outlay is estimated at upwards of a million and a half sterling. In the Punjaub and the Madras presidencies there is a similar system of canals and irrigation, suited to the natural characteristics of each country. The total length of the canal, comprised between the rivers Sutlej and Ravee, when finished, will be 450 miles in length, and will cost about half a million sterling.

But the introduction of railways through the very heart of the country, presents the most interesting features to the eye of the statesman and philanthropist. By this agency a vast empire will soon be linked together, and the social and moral advancement of the whole community be thus promoted, and eventually consolidated. The opening of the lines, for short distances, from Calcutta, have been hailed by the natives with acclamation; and the old distinction of caste appears to be breaking down by the daily amalgamation of all classes in the same railway carriages. The great trunk lines are also in the course of rapid formation. At the commencement of 1857, 120 miles had been opened of the grand line from Calcutta to Delhi, which will be 1100 miles in length; and from Bombay to Madras 71 miles had been opened. The three grand trunk railways, when completed, will be from Calcutta to Peshawur, 1423 miles, at a probable cost of 1,423,000*l.*; from Calcutta to Bombay, 1002 miles; and from Bombay to Agra, 734 miles. In conjunction with the railways may be mentioned the introduction of the telegraphic wire, more than 4000 miles of which are now in complete operation. The telegraphic communication between Calcutta and Agra, a distance of 800 miles, and from Agra to Bombay, and thence to Madras, are complete, and now in general use. Thus the whole of our Indian territories promise, ere long, to be reticulated with railways and electric wires.

Of the advantages derived from the possession and maintenance of our Indian possessions, under the rule of a wise and energetic government, the 'Westminster Review' offers the following appropriate and sensible remarks:—'No fewer than 10,000 British officers of the higher grade are to be numbered in the civil and military service of the Government, whose incomes range from 200*l.* to 25,000*l.* a year. All these are well-born and educated men of the middle classes, who find an honourable provision out of the resources of India. The total sum they draw yearly cannot be less than 6,000,000*l.* or 7,000,000*l.* sterling. We have not included the European common soldiers, of whom there were 30,000 before the mutiny, and there will be in future at least 70,000 or 80,000. All these are maintained out of the Indian treasury at a cost which must hereafter exceed 3,000,000*l.* Again, there are the pensions granted to retired officers, officers' widows and children, in the two services, which are contributed by India and expended in England. In round numbers, we shall not be far wrong if we estimate the direct worth of India to Englishmen of all classes at not less than 10,000,000*l.*'

During the session of 1858 a bill was passed for transferring the government of India from the East India Company to the absolute rule of the British Sovereign and her Ministers. [EAST INDIA COMPANY, *Suppl.*] Accordingly, on the 1st of November, the Governor-General of India issued a proclamation, declaring that her Majesty the Queen of England had taken upon herself "the government of the British territories in India, and that from this day all acts of the Government of India would be done in the name of the Queen alone." In this proclamation her Majesty states "that all treaties and engagements made with the native princes of India by the authority of the East India Company will be accepted and scrupulously maintained." "We hold ourselves bound to the natives of our Indian territories," says Queen Victoria, "by the same obligations of duty which bind us to all our other subjects." "We declare it to be our royal will and pleasure that none be anywise favoured, none molested or disquieted by reason of their religious faith or observances, but that all shall alike enjoy the equal and impartial protection of the law;" and that

our subjects, of whatever race or creed, be freely and impartially admitted to offices in our services, the duties of which they may be qualified, by their education, ability, and integrity, duly to discharge."

HIPPOBOS'CIDÆ (Gr. ἵππος a horse, and βόσκω to feed), a family of dipterous viviparous insects, the type of the family being the *Hippobosca*, or Horse-fly. They are generally known by the name of Forest-flies, the young of which undergo their first metamorphosis in the womb of their parent, and are brought forth in the pupa state.

HIPPOCAM'PUS (Gr. ἵππος a horse, and καμπτὸς flexible), a genus of pipe fishes, of the family *Syngnathidæ*, with broad and compressed bodies and heads, a tubular and narrow muzzle, and small pectoral fins.

HIPPOCASTA'NEÆ (from *hippocastaneum*, the specific name of the horse chestnut), a subdivision of the order *Sapindaceæ*.

HIP'PONYX (Gr. ἵππος a horse, and ὄνυξ a claw), a genus of Limpets, of the tribe *Scutibranchia*, in which the shell is patelliform.

HIRU'DINÆ (Lat. *hirudo* a leech), a family of *Apodous Annelides*, of which the Hirudo is the type.

HISIN'GERITE, a mineral of a dull black colour, found in Sweden, and so called in honour of Hisinger, who first analysed it. It has an earthy fracture, capable of being cut with a knife. Its specific gravity is 3·04; and its constituent parts are—protoxide of iron, 47·80; silica, 27·50; alumina, 5·50; oxide of manganese, 0·77; water, 11·75.

HIS'PIDÆ (Lat. *hispidus* bristly), a family of Coleopterous insects, of the tribe *Monilicornes*.

HISTER'IDÆ (Lat. *histrio* an actor), a family of Coleopterous insects, of the tribe *Lamellicornes*.

HISTIOPH'ORUS (Gr. ἱστίον a sail, and φορέω to bear), a genus of Sword-fishes, of the family *Scomberidæ*, and sub-family *Xiphianæ*.

HISTOL'OGY (Gr. ἱστὸς a web or tissue, and λόγος a discourse), the science of organic tissues, embracing that department which relates to the minuter structures and tissues of animals and plants. This science is comparatively of modern date, and may be said to have originated with Malpighi and Leeuwenhoek, at the commencement of the seventeenth century, when magnifying glasses began to be applied to the minute examination of the ultimate cellular structures of animals and plants. In later times the investigations of Dr. Schwann and M. Bichat materially contributed to our knowledge of the science; and Professor Kolliker, to whose 'Manual of Human Histology,' our readers are referred, has presented a general history of the subject. 'If it be possible,' says the Professor, 'that the molecules which constitute cell-membranes, muscular fibres, axile fibre of nerves, &c., should be discovered, and the laws of their opposition and of the alterations which they undergo in the course of the origin, the growth, and the activity of the present so called elementary parts, should be made out, then a new era will commence for histology, and the discoverer of the law of cell-genesis, or of a molecular theory, will be as much or more celebrated than the originator of the doctrine of the composition of all animal tissues out of cells.'

HISTRIO'NES, pantomimic actors among the ancient Romans, who were considered as inferior to the performers of the regular drama. Hence was derived the term *histrionic*, as applied to the modern stage.

HOAR-FROST, a congelation of dew and mist, formed by the temperature of the atmosphere suddenly falling below the freezing point, or 32°; or by the sudden refrigeration of the substances by which their surface moisture is converted into icy particles. Perhaps the face of nature never assumes a more picturesque or pleasing appearance than on the mornings of a strong hoar-frost, when the fogs have disappeared, and the bright azure sky gleams over the productions of the earth. But on the return of the solar warmth, the scene rapidly changes, and the spicular and granular particles, of which icy dew is composed, are gradually transformed to their original moisture.

HOCK-TIDE, among our mediæval ancestors, a day set apart for sports and public rejoicings, in celebration of the slaughter and expulsion of the Danes, by which the country was freed from their oppression. It was the second Tuesday after Easter, and formed a kind of epoch or period from which leases or other written agreements were dated.

HOFLAND, MRS. BARBARA, the well-known authoress, was the widow of Mr. Hofland, landscape painter, and daughter of Mr. Wreaks of Sheffield, where she was born in 1770. She lost her father at an early age, and at twenty-six married Mr. T. B. Hoole, a young man of high respectability, who died two years afterwards, and left her, with one child, in straitened circumstances. This obliged her to have recourse to her educational talents for the means of subsistence. She commenced her literary career in 1805, by the publication of a volume of poems by subscription, which was extensively patronized, and enabled her, from the proceeds, to establish a respectable school at Harrowgate, where she was in the habit of occasionally writing and publishing various works of a moral or amusing tendency. She afterwards contracted a second marriage with Mr. Hofland, the eminent landscape painter. But she still continued to devote herself to the pursuit of light and elegant literature. Among the principal of her works may be mentioned the novels of 'Beatrice,' 'Emily,' the 'Son of a Genius,' 'Captives in India,' 'Self-denial,' 'Adelaide,' 'Decision,' the 'Czarina,' 'Tales of the Priory,' and 'Tales of the Manor.'

Mrs. Hofland was a woman of exemplary character, who bore all the troubles and afflictions of life with enduring patience; and the best evidence of her claims as an authoress is the fact that she produced about seventy different works, of which 300,000 copies have been circulated in this country alone. In America also their sale has been very extensive, 20,000 copies of the 'Czarina' having been printed and sold there on its first appearance. Her works have also been translated into various continental languages. She died

in 1845, and was interred at Richmond in Surrey.

HOL'ETRA (Gr. ὅλος entire, and ἦτρον the abdomen), an order of Spiders, in which the thorax and the abdomen are closely joined, and appear as one.

HOLMAN, JAMES, a lieutenant in the navy, and generally known as the 'Blind Traveller,' was born in 1787; he had the misfortune to lose his sight at the age of twenty-five, and in 1812 was appointed one of the Naval Knights of Windsor. When he had become accustomed to the deprivation of sight, he determined, for the purpose of amusing his mind, to undertake a journey through Europe. Accordingly he undertook a tour in 1819–21 through France, Italy, Savoy, Switzerland, and various parts of northern Germany. His travels were published, and found replete with many amusing incidents and observations. In 1822 he undertook a voyage to St. Petersburgh, and thence proceeded to Moscow, Novgorod, and Irkutsh, in Siberia; but here he received an imperative order from the Emperor, by which he was obliged to return. He afterwards undertook a series of voyages and travels round the world, comprehending Africa, Asia, Australia, America, &c., which were subsequently published. From South America he crossed to the Cape of Good Hope, and visited in succession Madagascar, Ceylon, Hindustan, New South Wales, Van Dieman's Land, and New Zealand. In 1843 he went to the Adriatic, and there visited Bosnia, Servia, Dalmatia, Montenegro, and other places. His series of voyages and travels excited much interest when published; but they can never be considered as reliable authorities. He died in 1857.

HOLOCAN'THUS (Gr. ὅλος entire, and ἄκανθα a spine), a genus of fishes, of the family *Chætodonidæ*, in which the pectoral and ventral fins are pointed, and the properculum armed with a strong spine at its lower angle.

HOL'OCAUST (Gr. ὅλος the whole, and καυστὸς burnt), among the classical ancients, a religious sacrifice, in which the whole instead of a portion of the victim was burnt as an offering to the gods. The custom was not dissimilar to the burnt offering of the ancient Jews, which consisted of a bullock without blemish brought to the tabernacle of the congregation. But at the feast of Tabernacles, during the eight days' festival, the Jews offered seventy bullocks, &c.

HOLOCENTRI'NÆ (Gr. ὅλος, and κέντρον a spur), a family of the *Percidæ* or Perches, in which the bodies are covered with sharp rough scales, or thorn-like plates, and the head is very spiny.

HOLOLEP'TA (Gr. ὅλος, and λεπτὸς thin), a genus of Coleopterous insects of the family *Clavicornes*.

HOLOP'TYCHUS (Gr. ὅλος, and πτυχὴ a fold), a genus of fossil ganoid fishes found in the coal formation. The scales of this singular animal resemble those of reptiles, and present a wrinkled appearance. 'There is nearly a perfect specimen,' says Professor Ansted, 'measuring as much as thirty inches long without the tail, and the proportions are singularly massive. The head is small; but the unclothed jaws, covered with hard enamel instead of skin, are lined with a double row of teeth; the outer range thickly set, and fringing the enamelled edge of the mouth; the inner ones wider apart, and more than twenty times as large.'

HONDURAS, a republic of Central America, situated in lat. 13° to 16° N. and 85° to 89° W. It is bounded on the north and east by the Caribbean Sea and Mosquitia; west, by Guatemala; south, by Salvador and the Bay of Comayagua on the Pacific; and south-east, by Mosquitia and Nicaragua. The State is divided into seven departments, named after their principal towns, of which Comayagua is the capital. Of the ports, the chief are Truxillo, on the Caribbean Sea, and Port San Lorenzo, in the Bay of Comayagua. The republic consists of a senate of fourteen members, a legislative chamber of fourteen deputies, and a president elected by the two chambers. The population at the last census was estimated at 308,000. [AMERICA, CENTRAL, *Suppl.*]

HONOUR, COURT OF, in military matters, a term applied to a board of inquiry appointed to ascertain the degree of guilt attached to misconduct, and also to decide whether the individuals charged may or may not have been guilty of ignominious behaviour.

HONOURS OF WAR, a military term applied to the conditions under which a fort or city is evacuated. In such cases the retreating forces are presumed to depart with all their colours, baggage, artillery, &c. But sometimes they have to retire to a distance, pile their arms, and surrender as prisoners of war. *Military Honours* are salutations paid to crowned heads or officers of rank, by the discharge of artillery, dropping colours, and other modes.

HOOKAH, an Indian tobacco-pipe, the stem or tube of which is made of cocoa-nut, while some ornamental tubing lengthens it out into several coils. The mouth-piece is usually of amber; the bowl of shell, silver, or earthenware; and the smoke passes through a glass water-vase. These hookahs are in almost universal use among the upper classes of the Arabs, Turks, Indians, Egyptians, and other Oriental nations; and on all occasions of friendly visits they are considered as the calumets of peace.

HOP. [HUMULUS LUPULUS.]

HOPLI'TES (Gr. ὁπλίτης armour), among the ancient Greeks, such of the candidates at the public games as ran races in armour.

HORNGELD, a tax paid in the feudal ages for horned beasts feeding in the forest; and none could be free without a privilege granted by the king, according to the charter of Henry III.

HORSE-GUARDS, a public military establishment, situated in Whitehall Place, Westminster, to which all official communications relative to the British army are transmitted. Here are the offices of the commander-in chief, the secretary of war, quartermaster-general, adjutant-general, &c., and where the commander-in-chief receives all applications, either personal or otherwise, relating to the army.

HORSE-POWER, the strength of a horse in

draught, and a term in very general use to express the dynamical unit of the working power of a steam-engine.

HORSES, TAMING OF (vii. 305). The subjugation of vicious or intractable horses, by which they can be rendered docile and obedient to the requirements of man, is a matter of serious consideration; and various methods have been pursued to effect so desirable an object. We have already stated that the general management of the horse must not be by 'tyranny or brutal usage, but by kindness;' and Youatt, in his valuable treatise on the subject, says, that 'it is surprising how soon, under a system of kind management, the animal which has been accustomed to go where he pleased, and to do as he thought fit, may be taught to yield up his will to another, and to obey with alacrity his master's bidding. If there is a kind-hearted and faithful servant about the premises who will undertake this task, the breeder is fortunate; for, without this, he is often compelled to resign his colt to the tender mercies of a colt-breaker,—a man who seldom has any conception of obtaining his object by the moral influence which kindness would give him over the youngster, but who has too frequent recourse to violence, and that of the most outrageous kind, until the colt becomes a dull, dispirited, useful, but desponding and ill-treated slave through life, or, cherishing a deep feeling of wrong and a spirit of revenge, becomes determinedly vicious and dangerous.'

The important secret, however, of taming the horse, which is in accordance with the principles laid down by Mr. Youatt, has been lately communicated by a gentleman named Rarey, a native of Ohio in the United States, where he had passed a length of time in experimenting on wild horses, asses, mules, &c. In London he gave the most convincing proofs of his extraordinary powers, by immediately reducing some of the most vicious and unruly animals to a perfect state of docility and obedience to his commands. The process was for some time kept secret; but at length the operator undertook to divulge it, on the receipt of 10*l.* each from a given number of subscribers. The list was soon filled up; but soon afterwards there appeared a little work (published by Messrs. Routledge and Co.), entitled 'The Taming of Horses, by J. S. Rarey,' which at once explained the whole secret, and repudiated all ideas of mesmeric, galvanic, or magnetic influence. 'The only science,' says Rarey, 'that has ever existed in the world, relative to the breaking of horses, which has been of any value, is that true method which takes them in their native state, and improves their intelligence.'

Mr. Rarey, however, appears to have derived the leading ideas of his system from W. J. Powel, who published a work in 1814, on the 'Art of Taming Wild Horses.' Powel states that by his process the time of *gentling* a horse was from two to sixteen hours; while Rarey says that the time he has most commonly employed has been from four to six hours. Powel enters into an elaborate explanation of his method, of which the following is the substance. 'If the horse,' says he, 'belongs to that class which appears only to fear man, you must introduce yourself gently into the stable, room, or yard where the horse is. He will naturally run from you, and frequently turn his head from you; but you must walk about extremely slow and softly, so that he can see you, whenever he turns his head towards you, which he never fails to do in a short time. At the very moment he turns his head, hold out your left hand towards him, and stand perfectly still, keeping your eyes upon the horse, watching his motions if he makes any. If the horse makes the least motion, when you advance towards him, stop and remain perfectly still until he is quiet. Remain a few moments in this attitude, and then advance again in the same slow and almost imperceptible manner. When you are near enough to touch him on the forehead, raise slowly and by degrees your hand, and let it come in contact with that part just above the nostrils, as lightly as possible. If the horse flinches (as many will), repeat with great rapidity these light strokes upon the forehead, going a little further up towards his ears by degrees and descending with the same rapidity, until he will let you handle his forehead all over. Now let the strokes be repeated with more force over all his forehead, descending by lighter strokes to each side of his head, until you can handle that part with equal facility. Then touch in the same light manner, making your hands and fingers play around the lower part of the horse's ears, coming down now and then to the horse's forehead, which may be looked upon as the helm that governs all the rest. Having succeeded in handling his ears, advance towards the neck, with the same precautions, and in the same manner, observing always to augment the force of the strokes. Whenever the horse will permit it, perform the same on both sides of the neck, until he lets you take it in your arms without flinching. Proceed in the same progressive manner to the sides, and then to the back of the horse. Every time the horse shows any nervousness, return immediately to the forehead as the true standard, patting him with your hands, and thence rapidly to where you had already arrived, always gaining ground a considerable distance farther on every time this happens. The head, ears, neck, and body being thus gentled, proceed from the back to the root of the tail. From the tail come back again to the head, handle it well, as likewise the ears, breast, neck, &c., speaking now and then to the horse. Begin by degrees to descend to the legs, always ascending and descending, gaining ground every time you descend, until you get to his feet. Talk to the horse in Latin, Greek, French, English, or Spanish, or in any other language you please, at the same time lifting his foot with your hand. He soon becomes familiar with the sounds, and will hold up his foot at command. Then proceed to the hind foot, and go on in the same manner, and in a short time the horse will let you lift them, and even take them up in your arms. As the horse doubtless experiences a certain pleasure from this handling, he will soon become gentle under it, and show a very marked attachment to his keeper.'

Mr. Rarey approves of these instructions but

he observes that they are not quite sufficient for horses of all kinds. 'In order,' says he, 'to take horses as we find them, and train them to our own liking, we must always take with us, when we go into a stable to train a colt, a long switch whip, with a good silk cracker, so as to cut keenly and make a sharp report, which, if handled with dexterity, and rightly applied, accompanied with a sharp fierce word, will be sufficient to enliven the spirits of any horse.' With this whip in your right hand, with the lash pointing backward, enter the stable alone.'—Then 'stand still, and let your horse look at you a minute or two, and as soon as he is settled in one place approach him slowly, with both arms stationary, your right hanging by your side, holding the whip as directed, and the left bent at the elbow, with your hand projecting. As you approach him go not too much towards his head or croup, so as not to make him move either forward or backward, thus keeping your horse stationary; if he does move a little either forward or backward, step a little to the right or left very cautiously; this will keep him in one place. As you get very near him, draw a little to his shoulder, and stop a few seconds. If you are in his reach he will turn his head and smell your hand. Favour every inclination of the horse to smell or touch you with his nose. Always follow each touch or communication of this kind with the most tender and affectionate caresses, accompanied with a kind look, and pleasant word of some sort. The horse soon learns to read the expression of the face and voice, and will know as well when fear, love, or anger prevails, as you know your own feelings.'

Mr. Rarey's method of curing a wild or kicking horse is to tie up one of his fore feet, so that his hoof will appear bottom upwards, and nearly touching his body. There is no process in the world equal to it for breaking a kicking horse. He will sometimes become very restive, and try every possible way to get down the leg; but on finding he cannot do that, he will soon become settled down; and when you perceive that he is subdued, advance gently towards him, let down his foot, rub his leg with your hand, caress him, and let him rest a little; then put the leg up again; and by repeating this process several times the horse will soon learn to walk some little distance on three legs. Let him be the most vicious horse in the world, he cannot kick in this position. When he has been taught to understand that you do not intend to hurt him, you can let down the leg, and drive along gently without further fear or trouble.

HOSIERY (vii. 308). Of the different machines brought into use for the manufacture of these articles, the circular hosiery or knitting machine may be ranked among the most ingenious contrivances of the age. It can work all kinds of 'looped fabrics' with the most wonderful facility; and a single girl can produce, by the aid of one machine, material enough in one day for twenty dozen pairs of stockings. For the great improvements in this art we are chiefly indebted to Chevalier Clausen, whose successful labours in the manufacture of flax [FLAX, *Supplt.*] have deservedly attracted public attention. The working of this hosiery machine is remarkably simple. A woman turns a handle, with the same ease as the turning of a barrel organ, and a stocking, or a petticoat, or a jacket, is immediately woven. To see ten or twelve hundred needles starting up and down, and looping the thread into a chain as the machine revolves, is one of the greatest curiosities of this mechanical age. The old stocking frame is rapidly disappearing; but notwithstanding, by the cheapening of production, and the increased demand caused thereby, the employment of operatives is yearly increasing.

HOSPITALS (viii. 309). The Statistical Society of London have published some important details of these important institutions. According to their report, there are in London fifty hospitals for the reception of patients, besides sixty dispensaries, which afford outdoor relief in surgical and medical cases. Of the fifty hospitals fourteen may be classed as general, and thirty-six as special; the former admitting patients of both sexes, and of all ages, and with many forms of disease; the latter having some distinctive or restricted scope, either in regard to the diseases treated, or the classes of the population relieved. Of the former kind are St. Bartholemew's, Guy's, the Middlesex, the London, and other general hospitals; while the latter division includes the hospitals for women and children, the Seamen's hospital, the Germans' hospital, those for fever, small pox, consumption, cancer, and other particular diseases; together with lunatic asylums and all institutions receiving patients for special treatment. From the reports of the various institutions it appears that more than 45,000 cases of disease are treated every year in the wards of the hospital, and that about 600,000 out-patients are provided with medical relief in the hospitals and dispensaries. This makes a total of above 645,000. Taking the population of the metropolis at 2,500,000, this gives about one in five receiving gratuitous medical advice and assistance.

The general hospitals are now fourteen in number, admitting into their wards in the course of a year about 33,000 in-patients, and treating as out-patients, or casual sufferers, about 313,000 more, or a total of 346,000 patients. The seven oldest and best endowed of the general hospitals are—St. Bartholomew's, in Smithfield, (founded 1547); St. Thomas's, in Southwark (1553); Westminster, in Broad Sanctuary (1719); Guy's, in Southwark (1724); St. George's, at Hyde Park Corner (1733); London, at Whitechapel (1740); Middlesex, in Berners Street (1745).

The exact number of cases, according to the latest complete returns, was 346,514 for the fourteen general hospitals, of which 219,035 cases were treated in the seven named in the foregoing list, leaving 127,479 cases among the seven newer institutions, viz., the Royal Free Hospital, now in Gray's Inn Road, formerly in Hatton Garden, founded in 1828; the North London, or University College Hospital, Upper Gower Street, founded in 1833; Charing Cross Hospital, 1834; Metropolitan Free Hospital, Devonshire Street,

Bishopsgate Street, 1837; King's College Hospital, Portugal Street, Lincoln's Inn Fields, 1839; London Homœopathic Hospital, Golden Square, 1849; and St. Mary's Hospital, Paddington, 1850.

Some of these hospitals have attained as large a scope as the older establishments; King's College Hospital admitting 1275 in-patients, and attending 26,419 out-patients annually, or 27,694 in all; University College Hospital, 1410 in and 16,505 out-patients, or 17,915 in all; and Charing Cross Hospital, 1203 in and 13,798 out-patients, 15,001 in all. At the Royal Free Hospital in Gray's Inn Lane, with about 1100 in-patients, there are about 35,000 out-patients.

Of the thirty-six hospitals for special classes of patients, or for particular complaints, four are hospitals for women, or for women and children, and four are lying-in institutions, the latter having been all founded in the middle of the last century from 1749 to 1765. The number of women received or attended is not above 2000 altogether in these four institutions.

Of the other hospitals for special classes, there are two for seamen, one of which is the ship Dreadnought, well known to all who pass up and down the river Thames. Last year the Dreadnought was broken up, and a fine ship, the Caledonia, distinguished at the bombardment of Acre, substituted in its place, the name being altered to that of the old ship. It received, in 1855, 2130 patients on board, besides 1650 out-patients, or 3780 in all. The Poplar hospital for seamen has no in-patients, but relieves about half that number of out-patients annually. The German hospital at Dalston has about 800 in-patients in the year, and 7730 out-patients, attended at branch dispensaries at Houndsditch, and at No. 336, Oxford Street. The great majority of the special hospitals are those in which particular classes of disease are treated; and there are few maladies of common occurrence which have not an institution set apart, where the best skill and greatest experience are at the service of the suffering poor. The following are the principal hospitals of this class:—London Fever Hospital, receiving upwards of 1100 patients; Small-pox and Vaccination, nearly 1000 cases, and 325 vaccinations; Consumption, (1) Brompton, 416 in-patients, and 3641 out-patients; (2) City of London, Victoria Park, 107 in and 4734 out—in all 8898; Cancer, 136 in and 750 out; Fistula, St. Mark's, City Road, 606 in-patients; Ophthalmic (1), Royal London, Moorfields, 344 in, 10,595 out; (2) Royal Westminster, Charing Cross, 137 in, 5222 out; (3) London Central, Gray's Inn Road, 3138 out-patients, in all 19,436; Orthopœdic, for spinal diseases and other deformities, three hospitals relieving upwards of 1400 cases annually; Skin diseases, Bridge Street, Blackfriars, 10,650 cases; Lock Hospital, Westbourne Green, 408 in, 1872 out, in all 2280 cases. Besides these there are hospitals for incurables, including cases dismissed, unrelieved, from other institutions; two invalid asylums; a convalescent institution at Walton-on-Thames, and the Royal Sea-bathing Infirmary at Margate, where London patients are transferred; and several others of a miscellaneous character. Here, too, are to be mentioned the asylums for lunatics and for idiots. Of the lunatic asylums five are for paupers,—Bethlem, with 598 inmates; St. Luke's, 372; Hanwell, 1019; Middlesex, Colney Hatch, 1246; and Surrey, about 1000.

The whole thirty-six special hospitals receive in the year about 12,355 in-patients, and treat about 56,000 out-patients, besides about 20,000 not distinctly specified in the returns as either in or out-patients, making a total of about 88,355 cases. Connected with the hospitals and dispensaries are various institutions to be included under the head of medical charities. There are two Nurses' Training Institutions, one founded in 1840, and the other in 1848, besides that on a larger scale planned since the Crimean war, and to be associated with the honoured name of Florence Nightingale. There are also many foundations under the name of Samaritan Funds, Convalescent Funds, Linen Funds, and the like, connected with several of the hospitals.

As to the income for the support of these costly institutions, we learn, from a report of the Statistical Society of London, that the general hospitals in London possess an income from realized property to the amount of 109,687*l.*; annual subscriptions, 17,091*l.*; donations, 16,636*l.*; legacies, 10,206*l.*; and their miscellaneous sources of income to 1996*l.* The total income of all these hospitals, from every source, is 155,616*l.*, and the annual contributions of the public amount to 45,929*l.* In addition to the above hospitals there are, in the metropolis, thirty-six special hospitals possessing an aggregate income of 117,218*l.*, making the income of the general and special hospitals taken together amount to 272,834*l.* There are also returns from forty-two general dispensaries, possessing incomes from all sources of 21,000*l.*; and eighteen special dispensaries with annual incomes of 8064*l.* If these two sums, making 29,064*l.*, be added to the former, it gives the enormous amount of 301,898*l.* annually expended in medical charities in this metropolis; and this sum, large as it is, excludes Samaritan and other funds, connected with hospitals and dispensaries, Poor Law Medical Relief (28,766*l.*), cost of maintenance of pauper lunatics (79,998*l.*), vaccination (4292*l.*), and nurses' training institutions. All these sums would make a grand total of nearly half a million expended on our sick poor.

London and Paris present a striking contrast in the methods which they adopt for affording relief to the sick poor. In London a great part of our medical relief is dispensed at the houses of the poor themselves by the physicians and surgeons attached to our dispensaries. In Paris, on the contrary, comparatively little relief is afforded otherwise than in the hospitals themselves. Thus, in the year 1858, the number of in-patients in hospitals in Paris amounted to no less than 91,754 against only 45,808 in hospitals in London; this calculation, in the case of London, being exclusive of patients treated in workhouse infirmaries. But on the other hand, under

the system of out-door medical relief recently set on foot in Paris, 102,472 persons received gratuitous attendance, against upwards of 600,000 patients similarly relieved in London.

(*Statistical Society of London; Medical Times, &c.*)

HOWLEY, MOST REV. DR. WILLIAM, Archbishop of Canterbury, and Primate of all England, was born at Ropley near Alresford, in Hampshire, in 1765. He was educated at Winchester, under the tuition of Dr. Warton; and in 1783 he proceeded as a scholar to New College, Oxford, where he was elected fellow in 1785. After passing successively through the different university degrees he was appointed, in 1809, Regius Professor of Divinity. In 1813 he was promoted to the see of London. In the following year he made his primary visitation as the new Bishop of London, and the eloquent charge which he delivered on that occasion produced a deep sensation, especially amongst the Unitarians, whom he represented as '*loving* to question rather than learn.' To this Mr. Belsham published a powerful reply, and accused the Bishop of promulgating the slavish doctrines of Popery rather than the free spirit of Protestanism. But while exhibiting the principles of intolerance on the one hand, his lordship appears to have displayed a feeling of political obsequiousness on the other. He was one of the most strenuous supporters of the bill of pains and penalties against Queen Caroline, in 1820; and on that occasion he enunciated, with much emphasis, the slavish doctrine, that the king could do no wrong, either morally or politically. This uncompromising defence of 'right divine' did not fail to secure the good-will and patronage of his Majesty George IV.; for on the death of Archbishop Manners Sutton, in 1828, his lordship was translated to the Archiepiscopal see of Canterbury. The Duke of Wellington was then prime minister, and imagined that he could rely on the support of the new primate in carrying the Catholic Emancipation Bill; but he was mistaken; for his grace declared that at his consecration he had sworn to stand by the Church of England; and he denounced the measures of the government as irreligious and revolutionary. Thus in 1829, and again in 1831, did the Archbishop struggle, first, against emancipation, and next against parliamentary reform, when he declared that from these measures the church and constitution, the altar and the throne, were in danger of certain annihilation. They have, however, long become a part and parcel of the law of the land; and notwithstanding the solemn declarations, and dark forebodings, of our most reverend prelate, the throne and the altar still remain, and apparently on a firmer basis than ever. The fact is, that although his grace was a learned theologian and an estimable private character, he was neither a statesman, an orator, nor a politician; but a time-serving supporter of 't. powers that be,' and an uncompromising opponent of all liberal progress. He died in 1848, and was interred in Addington Church, near Croydon.

HULLMANDEL, CHARLES JOSEPH, inventor of the lithographic art, was of German descent, and born in London in 1789. He first commenced his experiments on the newly-discovered art of lithography in Great Marlborough Street, in the year 1818, and there printed his own drawings taken from sketches made during his residence on the Continent. The success attending his efforts attracted the attention of the artistic world; and such was the encouragement he received, that he determined on devoting his entire time to the study and practice of lithography. The art being mainly dependant on the judicious application of chemical principles, he placed himself as a student under Professor Faraday. The first great improvement he effected was that of a graduated tint printed over a black and white impression, which imparted to it the appearance of a print on tinted paper, and gave a vast impulse to the encouragement of the art. It was the means of bringing out some of the splendid productions of Harding, Stanfield, Nash, and other eminent artists. Mr. Hullmandel also succeeded in producing various other improvements, such as printing in colours by means of different stones, and also printing from drawings made with a brush and liquid ink. This art he called Lithotint, for which he procured a patent. For this he received the reward which Louis Philippe of France had previously offered for the discovery. Several splendid works of art, executed by this process, soon afterwards made their appearance, which established the fame of the inventor, and confirmed the value of his art. But his active mind was not confined to lithography; for he directed it successfully to manufacturing improvements. He invented and patented a plan for multiplying patterns on rollers, intended for calico-printing by machinery, and also introduced a process for drawing patterns of coloured marbles on earthenware. He died in 1851.

HUME, JOSEPH, for many years the active representative of the Montrose district of burghs, and deputy-lieutenant of Middlesex, was born at Montrose in 1777. He was of humble origin, and obtained his elementary education at the local schools of his native town. At the age of thirteen he was apprenticed to a surgeon-apothecary at Montrose, and in 1796 he was admitted a member of the College of Surgeons of Edinburgh. The following year he entered, as assistant-surgeon, the marine service of the East India Company. His untiring assiduity and professional capabilities soon recommended him to the notice of his superiors; and during the Mahratta war, from 1802 to 1807, he filled the office of Persian interpreter to the army. At the same time he not only continued his medical duties, but filled successively some important situations in the offices of paymaster and postmaster of the forces, as well as in the Commissariat and prize agencies. From these multifarious civil employments he was so fortunate as to realize large emoluments; and returned to England, in 1808, in the full vigour of life, with a fortune of nearly 40,000*l.*, all honourably acquired. During the years 1810 and 1811 he travelled through Egypt, Greece, Turkey, Spain, Portugal, and other parts of Europe, which enabled him to obtain a fund of useful

information, necessary to fit him for his future career on the political arena of life. In 1812 he was elected M.P. for the borough of Weymouth and Melcombe Regis; and in 1818 he was returned for the Aberdeen district of burghs, comprehending his native town of Montrose. This may be considered as the stepping-stone to his independent and permanent position in the House of Commons. In 1830 he was returned for the county of Middlesex, which he continued to represent till 1837, when he was defeated by a small majority; but Mr. O'Connell was the means of procuring his return for Kilkenny. In 1841 he was thrown out of Parliament; but the following year he was again returned for his native place, Montrose, which he continued to represent to the time of his death, which took place in 1855.

During his long parliamentary career Mr. Hume was an active member of the liberal interest, and was engaged in most of the committees formed for the investigation of public abuses, or the amelioration of social grievances. He was the unwearied advocate of parliamentary reform, and the uncompromising opponent of every public abuse. He was one of the most frequent and voluminous speakers in the House. He proposed sweeping plans of reform, not only in the constitution of Parliament, but in almost every department of the state, in the army, navy and ordnance, in the Established Church, in the Ecclesinstical Courts, the civil and criminal laws, in the customs, general taxation of the country, &c. He was also a strenuous advocate for the abolition of military flogging, naval impressment, and imprisonment for debt; and nearly all these measures, which at various times he so strenuously advocated, have since been carried into operation. He carried, almost unsupported, the repeal of the old corporation laws, the prohibition of the export of machinery, and the Act for preventing mechanics and artizans from leaving the country. On the decease of the honourable gentleman, Lord Palmerston, when moving for a new writ for the Montrose district of burghs, passed a warm eulogium on the deceased gentleman. 'The party,' said he, 'to which he had devoted himself was his country, and, beyond his country, the general interests of mankind at large.'

HUMUS (Lat. *vegetable mould*), a name given by chemists and scientific agriculturists to that dark and crumbly soil which has been formed by the remains of plants exposed to the different stages of decomposition or rottenness. Thus when roots, wood, straw, or dung, lie upon or in the earth, they absorb moisture; and first becoming brown and soft, they afterwards assume a blackish-brown colour. Finally they become black and pulverulent, as may be easily seen on examining the superstratum of the soil in forest lands. In truth, vegetable fibre may be regarded as the principal producer of humus; such as leaves, straw, moss, peat, &c. When these substances turn to putrefaction and decay, their colour becomes dark, and they are converted into carbonic acid and water, which can be absorbed as nutriment by plants; for the fallen leaves and decayed roots, as well as the insects and worms which feed upon them, become subject to decomposition and decay, when the vital principle is gone. Then the carbon they contain is converted into carbonic acid; and the humus, when air and moisture can act upon it, is by degrees still further decomposed, and thus continually furnishes fresh supplies of carbonic acid to the roots of plants. Of all the ingredients of soils humus possesses the strongest power of absorbing the moisture, oxygen, and other constituents of the atmosphere favourable to vegetation.

HUNDRED, in commerce, a numerical amount which varies in different countries. In England it is usually estimated at 112 lbs. In Riga and Elsinore, the great hundred is twenty gross, or 2880 pieces. In Belgium the hundred of articles, in general sales, is 164 pieces. The hundred deals or planks in Christiana are reckoned at 127; in Sweden at 120; in Westwyck at 124; and in some other of the timber-exporting places of the north, at 132.

HUNDRED, TRIBUNAL OF THE, was a legislative body at Carthage, instituted, like our House of Commons, for the purpose of balancing or counteracting the power of the senate and nobility.—The *Senate of Five Hundred* was also a celebrated tribunal at Athens, whose business was to deliberate on all measures of State, or matters of law, intended to be submitted to the people for adoption. These senators were maintained at the public expense, and were required to meet every day for the despatch of business.

HUNGARY (vii. 337–42). On the breaking out of the French revolution, in 1848, different insurrectionary movements pervaded most of the eastern parts of Europe; and the Hungarians began to manifest a disposition to extend their political liberties. A deputation of 150 Hungarian noblemen had an interview with the Emperor of Austria upon the subject, when he conceded to their demand, and granted a constitution. But it afterwards appeared that his Majesty was not sincere; for it was soon discovered that he was playing a double part between the Hungarians and the Ban of Croatia, who had been making encroachments on their territory, and fought several battles. During the early part of 1849, Hungary was the theatre of various contests between the Austrians, under Windischgratz, and the Hungarians, under Bem, Dembinski, Georgey, and other skilful commanders, all being under the able direction of Kossuth, who had been elected political director of the national defences. The Austrians were signally defeated in many rencontres on the banks of the Danube. The whole of the kingdom of Hungary, north of the Danube, was in the hands of the Magyars. The siege of Comorn was raised, and Pesth evacuated by the Austrians. The demands of the Hungarians were chiefly the recognition of the kingdom of Hungary in its ancient limits, including Croatia, Slavonia, and the military boundaries; and the recognition of the Hungarian constitution of 1848. These demands were rejected by the emperor; and in the meantime he had obtained the assistance of the Emperor of Russia, who sent an immense army into the Hungarian territories to co-operate with

the Austrians. Hostilities were then vigorously carried on by the Hungarians. The Hungarian National Assembly, under the presidency of Kossuth, issued a declaration of national independence, deposing the house of Hapsburg Lorraine from the sovereignty. As the summer months advanced, the combined efforts of the Austrians and Russians became overwhelming. On the north the main force of the Russians effected its passage across the chain of the Carpathians. The movements of the corps under the Ban Jellachich were precisely the counterpart in the south. Buda and Pesth, the twin capitals of Hungary, fell into the hands of the Imperialists. Hermannstadt, the depôt of arms, and last bulwark of insurrection in Transylvania, was taken by General Lüders. To add to the misfortunes of the Hungarians, the force of Georgey, amounting to between 30,000 and 40,000 men, treacherously surrendered to the Russian General Paskiewitsch. This was the last fatal blow to the patriot cause. The Hungarian leaders, Kossuth, Dembinski, Bem, and others, took refuge in Turkey, the government of which afforded them protection against the demands of Austria and Russia. Comorn, the last stronghold of the Hungarian patriots, eventually capitulated, and was taken possession of by the Imperial troops in Oct. 1849. Thus was the whole of Hungary reduced to entire subjection to the house of Hapsburg.

HUNTINGDONSHIRE (vii. 346-9). According to the census of 1851, the entire population of the county was 64,183, of which 31,933 were males, and 32,250 females. Of houses, inhabited and uninhabited, there were 13,917. The area of the county was computed at 361 square miles, or 230,865 acres, comprehending 178 persons to a square mile. The population of the principal parishes and towns was as follows:—

Bluntisham	1550	Ramsey	2641
Godmanchester	2337	Somersham	1653
Huntingdon mu.	3882	St. Neots	2951
——— parl.	6219	Warboys	1996
St. Ives	3522	Yaxley	1445
Kimbolton	1633		

HURRICANES. [CURRENTS OF THE ATMOSPHERE, *Supplt.*]

HURTOIR, in fortification, the name of a long square piece of timber, which is placed at the head of the platform next to the interior slope of the parapet, for the purpose of preventing the wheels of the gun-carriage rolling down the slope.

HUSTINGS (Sax. *hustinge*), formerly the principal court of the city of London, in which the lord mayor and aldermen presided. According to Fleta (lib. ii.), other towns, as York, Lincoln, Winchester, &c., had courts of the same name; and their existence can be traced as far back as the laws of Edward the Confessor.

HYACIN'THINE, a mineral of a brown-green colour, transparent, and crystallized in rectangular eight-sided prisms; the fracture imperfectly conchoidal.—*Hyacinth* is one of the names given to the brown or yellow crystals of Zircon.

HYALOSID'ERITE (Gr. ὕαλος glass, and σίδηρος steel), a crystallized mineral, of a yellow-brown colour; the surface metallic, and the internal lustre vitreous. Its specific gravity is 2·87. Its component parts consist of silica, lime, alumina, magnesia, soda, protoxide of iron, and potash.

HYDERABAD, an important city and fortress of Hindustan, the capital of Sinde, on the banks of the Indus; and celebrated for a great battle fought between the British forces under Sir Chas. Napier and the Ameers of Sinde. The place was then captured, and the Ameers reduced to subjection.

HYDRA (Gr. ὕδωρ water), a genus (and the only one) of the family of the *Hydridæ*, of the order Gelatinosi, and class Polypi. Cuvier describes the hydra as among the simplest but most curious of all animal creation in its organization, merely consisting of a small gelatinous horn, provided with filaments that act as tentacula. Even the microscope discovers nothing in its form but a transparent parenchyma; yet these animals can crawl and swim, and even walk, by attaching the ends of their bodies alternately, like leeches or caterpillars. 'They are usually attached,' says Mr. Dallas, 'to some aquatic plant, and their most favourite station is among the rootlets of the duckweed, so common in all our ponds. The animal, when extended, consists of a long gelatinous cylinder, attached by one extremity to the subaquatic plant, and furnished at the other with very long tentacles, which it stretches about in the water in search of the minute animals on which it feeds.'

THE HYDRA.

The reproduction of the hydra is by gemmation, or budding, which appears in small tubercles on different parts of the parent animal; and these tubercles separate on arriving at maturity. In warm weather the young hydræ, by the process of gemmation, are produced very rapidly; and, what is still more extraordinary (as Baker observes, in his 'Natural History of the Polype'), 'the young ones themselves often breed others; and those others sometimes push out a third or fourth generation before the first fall off from the parent. Wonderful as these modes of reproduction may appear, they are surpassed by the artifi-

cial multiplication of the animal by the division of the body.' This was discovered by Tremblay, in his 'History of Polypes,' in 1774. He says, 'I have opened a polype on my hand, extended it, and cut the simple skin of which it is formed in every direction; I have reduced it to little pieces, and, in a manner, minced it. These little pieces of skin, both those which did and those which did not possess arms, became perfect polypes.'

These polypes are extremely voracious, and feed only on living animals. The larvæ of insects, worms, and the minute crustaceous animals which swarm in all waters, constitute their principal food. 'Sometimes two polypes,' says Mr. Dallas, 'will seize upon the same worm, when a dispute, of course, ensues, which occasionally ends in a very singular manner. If the weaker of the two does not feel inclined to let slip a booty for which he has perhaps been waiting with extended tentacles for several days, it sometimes happens that each polype swallows the end which has fallen to his share, until at length the worm being all gone, the mouths of the pair come into actual contact. They now find themselves in a position of considerable difficulty, which is sometimes terminated by the breaking of the worm; but if this does not take place, the larger or stronger of the two seizes upon his antagonist, and swallows him, worm and all. After a time the swallowed polype emerges uninjured from his living tomb.'

There are different species of this genus; as the *Corine*, the *Cristatella*, the *Pedicellana*, *Viridis*, *Oligactis*, &c.; but the most curious are the *Vorticellæ*, which abound in stagnant fresh waters, and are arranged as shrubs, plumes, or other agreeable forms; but they are generally too minute for observation by the naked eye. Very copious and interesting accounts of these gelatinous animals may be found in Baker's 'Natural History of the Polype,' and also Dr. Johnston's 'British Zoophytes.'

HYDRAS'PIS (Gr. ὕδωρ water, and ἀσπὶς a shield), a genus of river-tortoises, of the family *Emydæ*, in which the sternum is solid and narrow.

HYDRAU'LICA (ὕδωρ water, and αὐλὸς a musical pipe), an organ acted upon by water, and mentioned by ancient writers as producing musical sounds by the compression of water on a large vessel filled with air, by which pressure the air was forced from the vessel into the pipes of the instrument. Its particular construction, however, is not exactly known; but from Athenæus (who attributes the invention to Ctesibus), Plutarch, Hedylus, and others, we learn that it was capable of a great variety of harmony. Claudin speaks of its 'innumeræ voces,' or numberless tones. But the art of constructing these hydraulic organs appears to have been lost with the destruction of the Roman empire; and the Barbarians attempted in vain to recover it.

HYDRAU'LICS (vii. 371-6). The hydraulic press, as invented by Brahmah (p. 374), has been already described; but it was never calculated that the power of the machine would be so fully tested as it was in the raising of the Britannia Bridge. The ponderous machinery for effecting this great object has been thus described by the author of 'Novelties, Inventions,' &c.:—'Two wrought-iron girders weighing twelve tons each; two cast-iron beams of five tons each; a jacket of cast and wrought iron, around the cylinder, weighing eight tons; the cast-iron cylinder itself of fifteen tons; the ram or piston, to work within the cylinder, of nearly four tons; the cast-iron cross-head of thirteen tons; besides the clamps, chains, guide-rods, valves, and other parts of the mechanism. Such were the weights given to the parts of a machine intended for only one single operation, the raising of the tubular. The cylinder was nine feet high, three-and-a-half feet in external diameter, and formed with nine inches' thickness of metal. Although in its finished state it weighed only fifteen tons, yet twenty-two and a-half tons (more than 50,000 lbs.) of molten iron were required for the casting.' This was probably the largest casting ever previously executed. The greatest weight actually lifted by this extraordinary press at any one time, was 1144 tons (more than 2,500,000 lbs.), which was effected in lifts or distances of six feet each, requiring a little over half an hour for each lift. The stupendous force of hydraulic power has been still further tested in the launching of the Great Leviathan steam-vessel, of 22,000 tons burden. Without its agency, it is supposed, the object could never have been accomplished.

HY'DRIDÆ (Gr. ὕδρος a water-serpent), a family of snakes, of which there are a great variety of genera and species, as may be seen on a reference to the Catalogue of Snakes in the British Museum.

HYDROBO'RACITE (Gr. ὕδωρ water, and *boracite*), a white red-spotted mineral, obtained from silicated peroxide of iron. Its specific gravity is 1·9; and its constituent parts, according to Dr. Thomson, are boracic acid, 49·22; water, 26·33; lime, 13·74; magnesia, 10·71.

HYDROCAR'BONATE, a mineral obtained from New Jersey, consisting of water, magnesia, and carbonic acid, with traces of silica and peroxide of iron.

HYDROCHLO'RATES, the name of a genus of salts, formed from the combination of hydrochloric acid and salifiable bases.

HYDROCOR'ISÆ (Gr. ὕδωρ water, and κόρις a bug), a tribe of hemipterous or half-winged insects, comprehending the Water-bugs, the Water-scorpions, and the Boatmen. The Hydrocorisæ differ from the Land-bugs (Geocorisæ) in having minute antennæ beneath the eyes.

[The Greek word ὕδωρ (*hydor* water) is of very general application as a prefix to scientific terms, especially in botany, zoology, mineralogy, and chemistry; as *Hydrocotylæ* (water cavities), in botany a tribe of umbelliferous plants, of which the *Hydrocotyle*, or Pennywort, is the type, and so called from its growing in moist situations;—*Hydrocyon* (water-dog), in zoology, a genus of fishes, of the family Salmonidæ;—*Hydrolite* (water-stone), a prismatic crystallized mineral, of snowy whiteness, composed of silica, water, alumina, peroxide of iron, and potash; and 2·05 specific gravity;—*Hydrophides*, in zoology, a

family of Water-snakes, furnished with poisoned fangs, and belonging to the order Ophides;—*Hydrophilidæ* (water-loving), a family of Coleopterous insects, of the tribe Lamellicornes;—*Hydrosaurus* (water-lizard), a genus of Saurian reptiles, analogous to crocodiles;—*Hydroselenates* (water selenite), in chemistry, a class of salts, formed by the combination of hydroselenic acid with salifiable bases;—*Hydrosulphurets*, a class of salts produced by the combination of hydrosulphuric acid with salifiable bases;—*Hydrotellurates* (water tellurium), a kind of salts resulting from the combination of an acid composed of hydrogen and tellurium with salifiable bases.]

HYDROGRAPHIC OFFICE, an important government department connected with the Admiralty, where all navy surveys are received; and from them official charts are prepared, and published at a moderate price for the use of naval captains and navigators in general. The art of lithography is here very extensively employed.

HYMENÆ'A, the name of certain festivals celebrated at Athens, in honour of Hymen, the god of marriage, who is usually represented as crowned with flowers, and holding a burning torch in his hand.

HYMENOPHYL'LEÆ (Gr. ὑμὴν a membrane, and φύλλον a leaf), a family of ferns of the natural order *Gleicheniaceæ*. The various species of the genus *Hymenophyllum* may be classed among the most elegant of the ferns, and flourish most when grown in small pots, in a mixture of peat and loam.

HYMNS (vii. 403). Dr. Busby, in his 'Musical Dictionary,' says that 'the Hymns, or divine odes, of the ancient Greeks, generally consisted of three couplets,—the *strophe*, *antistrophe*, and *epode*. But Menander, the rhetorician, enumerates no less than eight different species of hymns. The Hymn appears to be among the most ancient of all poetical compositions; and was originally thought to be dictated by the gods themselves, or at least by men truly inspired. St. Hilary is said to have first composed hymns for the service of the church, in which he was followed by St. Ambrose and Prudentius; the latter of whom is the supposed author of those contained in the Romish breviary.' Among the ancients, however, this style of poetico-musical composition was not confined to mere religious ceremonies, but often used as a song of supplication previous to an engagement; and called the *Hymn of Battle*. Thus Xenophon, in his account of the first battle fought by the Greeks against the Persian monarch Artaxerxes, tells us, that the two armies were not more than four or five hundred paces apart when the Greeks, to the great surprise of Cyrus, began to sing the Hymn of Battle, according to the custom of their countrymen.

HY'ODON (Gr. *swine-toothed*), in ichthyology, a genus of fishes, of the family *Salmonidæ*, belonging to the *Clupinæ*, or Herrings.

HYPERO'ODON (Gr. ὑπὲρ above, and ὀδοντες teeth), a genus of *Cetacea*, or Whales, of which there is only one species known. It is sometimes caught in the British Channel; and is usually from twenty to thirty feet in length

HYP'OCAUST (Gr. ὑπὸ and καυστὸς, burnt under), among the ancient Romans a sort of subterranean stove for heating the baths, remains of which are frequently found in Italy and different parts of England even at the present day.

HYPOGÆ'A (Gr. ὑπὸ and γαῖα, under the ground), among the Greeks and Romans, a kind of subterranean vaults for the interment of the dead, which came into use when the custom of burning the bodies had been discontinued. Sometimes these hypogæa had many apartments, with niches for the urns, &c.

HYPOSEP'TES (Gr. ὑπὸ under, and Lat. *sepes* a hedge), a genus of birds, of the family *Merulidæ*, and belonging to the Short-footed Thrushes. They are distinguished from the other genera by their forked tails.

HYPOSULPHU'RIC ACID, in chemistry, an acid intermediate between sulphuric and sulphurous acids, usually containing two atoms of sulphur, and five of oxygen; its equivalent being 72.

HYPOXIDA'CEÆ (Gr. ὑπὸ under, and ὀξὺς sharp-pointed), an order of herbaceous endogenous plants, with hexapetalous flowers and tuberous roots. They chiefly inhabit the warmer latitudes of India, Australia, and America.

I.

IBRAIL, a town of Wallachia, situated on the left bank of the Danube, which has of late years assumed some importance as a place of commerce. It has been the cause of furious contests between the Turks and the Russians. It was captured by the latter in 1828, but restored to Turkey by the treaty of Adrianople. Population about 20,000.

ICE. [COLD AND ICE, *Supplt.*]

ICEBERGS (*ice*, and Germ. *berg* a mountain), vast bodies of floating ice, originally formed in the Arctic regions by the congelation of the fresh water that pours annually from the mountains of snow under the action of the solar rays. Some of them are the creation of ages, and are very

numerous on the coast of Spitzbergen and the eastern shores of Greenland. These ice-formations are cosmographically attributable to the spherical shape of the earth, and the obliquity of its axis, by which the presence of the sun is entirely withdrawn from the arctic and antarctic regions during the greater portion of the year; and the consequence is, that intense frost everywhere prevails. On the return of the sun, the bonds which connect the frozen masses of ice with the land are dissolved; and the ice itself being broken up into thousands of fragments of various sizes, is set afloat, and becomes dispersed by the winds and currents of the ocean. It is chiefly by the north polar current, which passes through the narrow sea that separates Greenland and Iceland, and descends upon the shores of Labrador, and thence to the south-east of the great Atlantic, that the ice-formed mountains of the northern regions are borne to the south, and seen floating in towering masses, until dissolved by the warmer temperature of the atmosphere and water. The mountains of ice, by which the ocean is thus traversed, appear in a great variety of shapes; sometimes as *Bergs*, or mountainous masses; at others as vast sheets of ice, called *Ice-fields*. These icebergs have the appearance of chalk or marble cliffs floating on the deep, and have been seen with an elevation of above 200 feet, and a circumference of two or three miles. We may best judge of their magnitude, when it is estimated that the portion which appears above the surface of the water is not more than one-seventh of the entire mass. Lieutenant Parry, during the first Arctic expedition under Captain Ross, measured an iceberg which was grounded in Baffin's Bay, at about twenty miles from the land, and in sixty-one fathoms of water. It was found to be 4169 yards long, 3869 broad, and 51 high. The weight of the whole was calculated to be 1,292,397,673 tons. The great distinction of icebergs from ice-fields, independently of their shape, is, that the former are fresh-water formations, which have their origin upon the land, and are identical with the glaciers of the Alps and other mountain ranges, but having their birth-places in the frozen regions of the North Pole. [GLACIERS, vi. 696.]

ICE-SPAR, a mineral of a light-grey colour, found near Naples. It is sometimes crystallized in thin and long six-sided tables. Its specific gravity is 4·32; and its component parts are, silica, 63·56; alumina, 24·06; potash, 10·03; lime, 0·94; peroxide of iron, 0·92; water, 0·37.

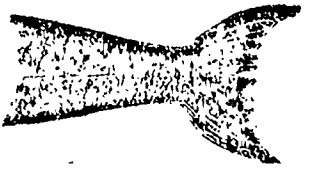
ICHNITES (Gr. ἴχνος a foot-step), in geology, those traces of foot-prints peculiar to the new red sandstone formation, which appear to have been impressed generally by reptiles and birds. The subject has been classed under two general divisions, viz. *Ichnolites* or foot-prints on stone, and *Ornithichnites*, or stony bird-tracks. Of the former, some interesting discoveries were made in 1828, by Dr. Duncan, on the new red sandstone, in the quarry of Corn Cockle Muir, in Dumfriesshire. The tracks were discovered in many successive layers of stone, to the depth of forty feet. In 1834 some remarkable footsteps were also discovered at Hesseburg, in Saxony, the hind foot of one of the largest animals being eight inches long. [CHEIROTHERIUM, *Supplt.*] Of the *Ornithichnites*, some very distinct traces were discovered, in 1836, in the red sandstone of the Connecticut Valley, and in other parts of Massachusetts, several specimens of which are now in the British Museum. These footmarks are referred to that class of birds called Waders, and the impressions were very similar to those made on the muddy banks of the river by the living aquatic birds common to the localities where these traces were found. Thus, by these faint traces, are we enabled to gain some notions, however indistinct, of the great history of Nature and of the first dawnings of animal existence in the history of the earth's crust.

ICHTHYOCOL'LA (Gr. ἰχθύς a fish, and κόλλη glue), a preparation from the fish known by the name of Huso; a kind of isinglass.

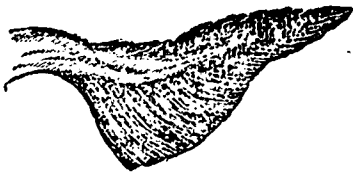
ICH'THYOLITES (Gr. ἰχθύς a fish, and λίθος a stone), in geology, a name given to those numerous fossils of the vertebrated order, some of which exhibit the most perfect animal structure, while others appear to be but a little removed from the humbler crustaceans. Agassiz divides these ichthyolitic remains into four orders of fishes, each characterized by the form and structure of their scales; thus a single scale often becomes a clue to the order and habit of the animal to which it belonged; and it is remarkable that the scales are precisely those of the finny tribes which are most abundant in a fossil state. The leading classification of scales is into enamelled and unenamelled. The former are divided into the *Placoidians* (broad-plated), and *Ganoidians* (shining); while those not enamelled are subdivided into *Ctenoidians* (comb-like), and *Cycloidians* (discus-shaped); but those only of the Placoidian and Ganoidian races are found in the ancient strata anterior to the chalk formation. The Ctenoidian and Cycloidian orders, to which the existing species of fish principally belong, make their appearance in the earth's crust after all the preceding fossil genera had become extinct.

There is another feature by which Agassiz distinguished the different kinds of fossil fishes. He divides them into three classes; viz. the *Round* tail, as in the wrasse;—

the *Crescent* tail, as in the trout;—



and the *Unequal* tail, as in the shark.



It is remarkable that nearly all the fossil fishes found in the ancient strata, beneath the magnesian limestone, are distinguished by these unequal tails; while in the superior or oolite systems, this form is seldom discovered.

Cuvier, in his great work on 'Fossil Organization,' had effected much towards the classification of fishes; but it was reserved for his distinguished successor, Agassiz, to complete the arrangement. He has raised the number of species to about 2000. His discoveries in the old red sandstone formation have been of the most extraordinary character; and their strange conformations, as he observes, would puzzle the naturalist to assign them even their class. 'Boat-like animals,' says he, 'furnished with oars and a rudder; fish plated over like the tortoise, above and below, with a strong armour of bone, and furnished with but one solitary rudder like a fin, covered with scales, creatures bristling over with thorns; others glistening in an enamelled coat, as if beautifully japanned; the tail, in every instance among the less equivocal shapes, formed not equally, as in existing fish, on each side of the central vertebral bone, but chiefly on the lower side, the bone sending out its diminished vertebræ to the extreme termination of the fin. All the forms testify of a remote antiquity, of a period whose fashions have passed away. The figures on a Chinese vase or an Egyptian obelisk are scarcely more unlike what now exists in nature than the fossils of the old red sandstone.'

ICH'THYOPHIS (Gr. *ἰχθύς* a fish, and *ὄφις* a serpent), a genus of fishes of the Eel kind, of the family *Murinidæ*.

I'CICA RESIN. Icica is the name of a plant in Guiana, of the natural order *Burseraceæ*, which attains a growth of thirty feet. Its resinous exudations are of great value in the districts where the plant flourishes, and furnish the elemi, carana, and tacamahaca resins.

ICONOCLAS'TES (Gr. *Image-breakers*), in church history a name given to the opponents of image worship when it was first introduced by the Romish church.

ICTE'RIA (Gr. *ἴκτερος* the jaundice), a genus of birds of the family *Merulidæ*, and belonging to the short-footed thrushes.

IDE'ALISM, the theory that denies the existence of material bodies, and makes everything to consist in ideas.

ID'RIALINE, a substance derived from a mineral, found in the quicksilver mines of Idria, which imparts to sulphuric acid a beautiful blue tint.

IGNA'TIA, a genus of plants, of the natural order *Logamaceæ*; one of the species of which produces the St. Ignatius beans of India, erroneously said to be a specific for cholera.

IKENILD STREET, one of the four great roads formed by the Romans in England. It commenced at Tynemouth, in Northumberland, and passing southward through Derby, Lichfield, &c., terminated at Southampton.

ILLUMINA'TI, the name of a secret order of society existing in Germany and some other parts of the Continent. Their professed object was to disseminate the purest principles of wisdom and virtue; but their real intention, it has been said, is the subversion of all existing governments and religions, in order to establish a perfect system of freedom and independence among mankind.

IMAN, the title or designation of a Mohammedan priest, or one who has the care and superintendence of a mosque. It is sometimes applied, *par excellence*, to the founders of the four chief sects of the Mohammedan religion.

IMBROGLI'O (Ital.), a term applied to the little burlesque theatrical pieces, the plot of which is perplexed or complicated. In literature it is also applied to the plot of a drama, or romance, which is involved in confusion.

IMMOR'TALS, among the ancient Persians a body of 10,000 soldiers, who constituted the personal guard of the sovereign, and were always of the same number. The same term was applied to the body-guard of the Roman emperors.

IMPORTS. [EXPORTS AND IMPORTS, *Suppll.*]

IMPRIMA'TUR (Lat. *it may be printed*), a formula granting permission to print any public document, book, or paper. It frequently appears in English books of the sixteenth and seventeenth centuries; and still continues in use in those countries subjected to the censorship of the press, where a permission to print is granted by a public functionary appointed for the purpose.

INCLU'SA (Lat. *shut in*), a family of crustaceous Mollusca, included in the arrangement of Cuvier, and described as living buried in sand, rocks, or mud.

INCOME TAX. By Stat. 5 & 6 Vict. c. 35, during Sir R. Peel's administration, it was enacted that a duty of 7*d.* in the pound for three years should be levied on all incomes exceeding 150*l.* per annum, which duty has been continued, with various modifications, as to amount, even to the present time. According to official parliamentary returns, the income tax in 1853 of 7*d.* in the pound, upon incomes of 150*l.* and upwards produced 5,388,691*l.*; in 1854, 7*d.* in the pound on 150*l.* and upwards, and 5*d.* on 100*l.* to 150*l.*, 6,001,028*l.*; in 1855, 1*s.* 2*d.* in the pound on 150*l.* and upwards, and 10*d.* on 100*l.* to 150*l.*, 12,086,522*l.*; in 1856, 1*s.* 4*d.* in the pound on 150*l.* and upwards, and 11½*d.* on 100*l.* to 150*l.*, 13,942,795*l.*; and in 1857 the same poundage yielded 14,286,032*l.* At present, all incomes, freehold and personal, of 100*l.* or upwards per annum, are liable to a tax of 5*d.* in the pound.

INDIA-RUBBER [CAOUTCHOUC, iv. 153]. This valuable material is now so extensively applied to the arts, that seven or eight hundred thousand tons are yearly imported, in blocks or slabs, into this country. It is transformed into

cakes, sheets, tubes, tissues, or solutions, preparatory to general use. But it is in the form of a sheet, or thread, that India-rubber is most extensively applied; and both of these processes are performed by cuttings from the blocks and slabs of the indurated material. For the former process an ingenious machine is used, in which a sharp knife is so adjusted as to cut, by a rapid vibratory motion, a thin fibre from a block of India-rubber. The separation of the material into narrow shreds is also an ingenious operation. These shreds are produced from a bottle or curved mass of India-rubber, and while the rough material is in rapid rotatory motion, a circular knife cuts through it, and thus separates the cake into one continuous spiral thread. From these threads a variety of textile fabrics are manufactured, chiefly by means of braiding machines. 'In such a machine (says the author of "Novelties, Inventions," &c.), several threads are twisted round each other, from three to nearly thirty in number. Each thread has its own bobbin, and all the bobbins revolve round a common centre, giving out their threads in the proportions and order required. Generally speaking, the braiding machine is employed in making stay-laces, braid, upholsterers' cord, &c.; but it is also applicable to making the numerous elastic cords and webs which owe their elasticity to India-rubber. When an envelope of cotton, silk, flax, or worsted, has been given to the thread of India-rubber by the braiding machine, the threads are laid as warp in a loom, and woven into the required kind of web, whatever it may be.'

But there is another yet more important discovery, connected with the application of this material to the arts; and this is *vulcanized Indian-rubber*, which is a compound of sulphur with the vegetable gum. The methods by which the combination is effected are various; but the effect is alike remarkable. The strength of the India-rubber is greatly increased, and the elasticity rendered more permanent. It has not only been applied to the making of over shoes, but also of boots, when the substance is corrugated, and capable of taking a high polish; and although perforated with small holes for ventilation, it still retains its water-proof qualities. The Americans have recently adopted a process of mixing coal tar with India-rubber, and the compound produces some of the most solid and elegant articles in the market. It resembles polished stone, is as black as jet, and receives as hard and exquisite a polish as it is possible for any metal to bear. Cabinet-work, of the most ornamental description, and an endless variety of useful articles, are composed of it; so that this new application of India-rubber is likely to produce a complete revolution in the arts and manufactures of our country.

INDIAN EMPIRE. [HINDUSTAN, *Suppl.*]

INDIGITES, among the classical ancients a name given to the local or inferior divinities, or to demi-gods who had existed on earth, and from their meritorious deeds were entitled to divine honours.

INFRALAPSA'RIANS, a sect of predestinarians, who held that a certain number of men had been born to be damned, without the means of saving themselves it they would.

INGFANGTHEF, among the Anglo-Saxons a privilege granted to lords of manors, to try and bring to judgment any thief taken within their boundaries. (Bracton.)

INGLIS, SIR ROBERT, formerly chairman of the East India Company, and many years M.P. for the University of Oxford, was born in London, in 1786. He was educated at Winchester College, under the late venerable Bishop Huntingford, and at Christ Church, Oxford, under Dr. Cyril Jackson. In 1818 he was called to the bar, and subsequently elected Recorder of Devizes. In 1812 he was appointed one of the Commissioners for the settlement of the affairs in the Carnatic, which office he held for many years. He first entered parliament in 1824, as member for Dundalk, and in 1826 was elected for Ripon; but on the change of policy, on the part of Sir Robert Peel, with regard to the Catholic question, Sir Robert Inglis was selected by the Protestant party as his substitute, and returned for the University of Oxford. He was not only an active member of the House of Commons, many of his speeches having been published, but he took an active part in numerous religious and educational societies connected with the Established Church; and was president, vice-president, or trustee, of most of the learned or scientific bodies of the great metropolis. He was the second baronet of the name, but with him the title has become extinct. He died in 1855.

INGRAM, REV. DR. JAMES, President of Trinity College, Oxford, and Rector of Garsington, was born at East Codford in 1774. After graduating at Oxford in 1800, as M.A., he was, in 1803, unanimously elected Anglo-Saxon Professor, on the foundation of Dr. Rawlinson. In 1807 he published an 'Inaugural Lecture on the Utility of Anglo-Saxon Literature;' and in 1809 he superintended a new edition of 'Quintilian de Institutione Oratoria.' In 1824 he was elected President of his college, to which office the rectory of Garsington is annexed. In 1823 he brought out a new edition of the 'Saxon Chronicle,' with an English translation. His 'Memorials of Oxford,' with plates prepared by Mr. Parker, is a work held in much estimation. He died in 1850.

IN'KERMAN, a village of Russia, in the south of the Crimea, thirty-five miles S.W. of Simpheropol, and celebrated as the site of a severely-contested battle between the Russians and the Anglo-French armies, on the 5th of November, 1854. On this occasion Prince Menchikoff made a sudden attack on the right of the English lines, with an army of 50,000 men; and the batteries of Sebastopol opened fire simultaneously with the attack. The British were taken completely by surprise. The 55th Regiment first received the dense masses of the enemy, and kept them at bay until the 41st and 49th came to their aid. A tremendous bayonet fight took place all along the Inkerman valley, in which the Russian forces were five times more numerous than the British. The slaughter was tremendous, and the British Guards were frequently exhausted by the physical labour of knocking down their enemies. A portion of the Russian troops had succeeded in penetrating

close to the tents of the second division, when General Canrobert, with three regiments of French Zouaves and half-a-dozen other regiments, opportunely advanced to the aid of the English, and gallantly forced the Russians to retreat, by a vigorous flank attack. The loss sustained by the English was very severe, there being 43 officers killed and 103 wounded; and 2265 men killed and wounded; Generals Cathcart, Strangways, and Goldie, and Colonel Egerton, being among the slain. The loss of the Russians was estimated at 14,000.

According to the ancient historians, Inkerman was once a city of some importance (the *Doros* of the Greeks); and there are still remains of caverns cut out of the rocks, which are supposed to be the works of the monkish anchorites during the Middle age.

INNISKILLINERS, a term in military language applied to the officers and soldiers of the 6th Dragoons and 27th Foot, on account of those two regiments having been originally raised at Inniskilling, a town of Ulster, where the inhabitants distinguished themselves in favour of William III. in his contests with James II.

INSOLVENTS (vii. 490–93). According to 10 & 11 Vict., c. 102, that branch of the law for the relief of insolvent debtors, which formerly required the commissioners of the court to make circuits through England to hear petitions in the provincial districts, is now exercised by the county-court judges, to whom the petition and schedule of the prisoner are to be transmitted.

INSTITUTES, the title of a book, in the old civil law of the Romans, which contained the elements or principles of their law. They constituted the great body of the *corpus juris civilis*, and were compiled by order of the Emperor Justinian for the use of students, and as a book of reference on law questions.

INSURANCES, FIRE (vii. 493). The following is an official return of duties paid by the principal county insurance offices in 1855, which will show the amount of business usually effected by each, and also the extent of taxation levied upon prudence, amounting to 3*s.* per cent. per annum upon the property insured.

	£		£
Norwich Union	75,130	Essex Economic	4,917
West of Engld.	49,928	Salop	3,833
Manchester	36,228	Nottingham and Derby	3,735
Royal	25,037	Sheffield	2,955
Liverpool and London	21,057	Norwich Equitable	2,693
Yorkshire	19,949	Kent Mutual	2,610
Lancashire	18,160	Provincial	2,583
Leeds and Yorkshire	18,114	Hants, Sussex, &c.	2,524
Birmingham	14,193	Shropshire and North Wales	1,734
Kent	14,066	Midland Counties	1,250
Birmingham District	7,948	Lincolnshire	618
Essex and Suffolk	6,096	Durham and Northumb.	298
Newcastle-on-Tyne	6,008		
North of England	4,938	Total	£346,397

To this may be appended a summary of the value of farming stock insured by county offices, which is exempt from duty by the Act of 3 & 4 William IV.

	£
Norwich Union	9,652,715
Yorkshire	3,276,085
West of England	1,352,278
Essex and Suffolk	1,332,682
Kent	1,128,631
Midland Counties	993,951
Manchester	753,575
Birmingham	726,520
Provincial	669,566
Leeds and Yorkshire	554,835
Salop	524,918
Newcastle-on-Tyne	450,829
Nottingham and Derby	447,736
Shropshire and North Wales	362,590
Essex Economic	349,325
North of England	332,797
Birmingham District	279,406
Royal	276,289
Norwich Equitable	262,916
Liverpool and London	250,131
Hants, Sussex, &c.	164,593
Lancashire	108,262
Sheffield	79,068
Durham and Northumberland	4,450
Total	£24,334,148

INTERMENTS. In January 14, 1854, a government order was given for closing the graveyards in and around the metropolis against all future interments, which were henceforth to be confined to the public and parochial cemeteries. [CEMETERIES, *Supplt.*]

INTRENCHMENT, in military matters, is a ditch or trench dug for temporary defence, with a parapet of earth thrown up for protection. When the ground is loose or sandy, fascines, gabions, or bags filled with earth or sand are employed to consolidate or strengthen the work.

INVERNESS-SHIRE (vii. 513). According to the census of 1851, the population of the county was 96,500; of houses, inhabited and uninhabited there were 17,536; the area 4256 square miles, or 2,723,501 acres. The population of Inverness and Beauly was as follows:—

Inverness	pa. 16,496	Inverness, roy. b.	9,969
	bor. 12,793	Beauly	pa. 3,007

IOLITE (Gr. *ἰον* a violet, and *λίθος* a stone), a mineral of a dark violet colour, which, when viewed by a light transmitted at right angles, appears of a yellowish brown. It is found crystallized in six-sided prisms. Its specific gravity is 2·56; and its constituent elements, silica, 50·24; alumina, 33·42; magnesia, 10·84; oxide of iron, 4·00; water, 1·50.

IONIAN ISLANDS (vii. 521–5). The population of these islands, in 1852, was 230,000; nearly all of Greek descent; and the imports of English and Irish produce amounted to 138,642*l.* The total value of imports at the last census was 781,121*l.*, and exports, 374,366*l.* The entire revenue was 137,978*l.*; and the public expenditure, 139,511*l.*; thus apportioned:—customs, 79,982*l.*; importation, 25,222*l.*; stamp duties,

12,372*l.*; miscellaneous, 20,402*l.*; total,137,978*l.* Expenditure:—military, 25,000*l.*; civil list (Lord High Commissioner's), 13,000*l.*; ditto, establishment, 42,299*l.*; judicial, 17,046*l.*; education, 10,271*l.*; contingencies, 24,157*l.*; miscellaneous, 7738*l.*; total 139,511*l.* The tonnage of vessels of all countries was 451,950 tons; cleared, 437,071 tons.

IPS (Gr. ἶψ a wood-piercing insect, so called from ἴπτω to destroy), a genus of Coleopterous insects, of the family *Silphidæ*, generally found under the bark of trees.

IRELAND (vii. 528–35). According to the census of 1851, the population of the sister kingdom was 6,553,290, which, on comparison with the returns of 1841, is a decrease of 1,621,834. Even in 1821 the population of Ireland amounted to 6,801,827; or 248,537 more than at the present time; and from 1831 to 1841 there had been a material increase. The great reduction of population, from 1841 to 1851, may be attributed chiefly to the general poverty, extensive emigration, and the fearful havoc of the great famine arising from the failure of the potato crop in 1845–6–7; and had it not been for the operation of the New Poor Law, enacted in 1838, the desolating horrors of that famine would have been much more universal. In some of the towns there were more persons in the workhouses than out of them; and even in 1849 there were no fewer than 923,234 persons that received in-door relief, and 1,210,482 out-door relief. But from 1850 to 1853 there was a steady decrease in pauperism, especially in out-door assistance. In 1853 there were only 59,938 able-bodied paupers in the Irish union workhouses; and since then, owing to emigration and the gradual demand for field labour, this class of paupers can scarcely be said to exist. It appears, however, that the population, notwithstanding its ameliorated social condition, was less in 1856 (ten years after the famine) by nearly half a million than it was in 1851. But in the midst of the everflowing stream of emigration, it is a gratifying circumstance, that the remittances from the Irish colonists to their countrymen have been on a most liberal scale. Thus, for instance, in 1855, there was remitted to friends in Ireland 873,000*l.*; in 1856, 951,000*l.*; and in 1857, from North America alone, 593,165*l.*, and this chiefly for the purpose of aiding those in the old country to emigrate. There can, therefore, be nothing surprising, if this spirit of emigration from Ireland should still continue.

The following is a list of the counties, with their present population, which, on comparing the returns with those of 1841 (vii. 531), will present many striking differences. The population of the principal towns are given under each county.

CONNAUGHT.	
Galway	322,259
Leitrim	111,915
Mayo	274,830
Roscommon	174,492
Sligo	128,511
Total	1,012,007

LEINSTER.	
Carlow	68,075
Dublin	404,992
Kildare	95,724
Kilkenny	158,746
King's County	112,080
Longford	82,350
Louth	107,657
Meath	140,750
Queen's County	111,623
Westmeath	111,409
Wexford	180,154
Wicklow	98,978
Total	1,672,538

MUNSTER.	
Clare	212,428
Cork	648,903
Kerry	238,239
Limerick	262,136
Tipperary	331,487
Waterford	164,051
Total	1,827,244

ULSTER.	
Antrim	352,264
Armagh	196,085
Cavan	174,303
Donegal	254,288
Down	325,575
Fermanagh	115,978
Londonderry	191,744
Monaghan	143,410
Tyrone	254,878
Total	2,008,525

PROVINCES.	
Connaught	1,012,007
Leinster	1,672,538
Munster	1,827,244
Ulster	2,008,525
Total	6,520,314

Notwithstanding the great reduction of population at the last census, and the social difficulties of Ireland previous to that event, it is satisfactory to record that a wonderful amelioration has since taken place, arising chiefly from the sale of encumbered estates, and other measures which have tended to raise the price of labour, and improve the condition of the peasantry. It appears that from 1849 to 1857, the Encumbered Estates Court, which was established by Act of Parliament for the sale of entailed estates (the rentals of which were absorbed by the interest paid for mortgages on the land), had disposed of 4164 petitions for the sale of land. The number of conveyances to new owners of land amounted to 7283, whilst 10,327 lots had been disposed of; that is to say by public auction in court, 7270; by provincial auction, 1436; and by private contract, 1621. The great bulk of the new proprietors are Irish; 7180 estates, or parts of estates, having been bought by Irishmen, and only 309 by Englishmen, Scotchmen, and foreigners—less than one-twentieth of the whole number. The gross price paid for land through the court reaches 20,475,956*l.* 8*s.* 4*d.*; of which sum 13,941,207*l.* 10*s.* was obtained by public auction in court; 2,824,381*l.* by provincial auction; and the rest—3,710,367*l.* 18*s.* 4*d.*—was obtained by private contract. Of the social improvements arising from this wholesome transfer of property, the most convincing evidences everywhere present themselves. Lord Carlisle, in speaking of the improved condition of the country, in 1856, states that though emigration, within the last fifteen years, had diminished the population by 1,000,000, the acres under cultivation had been increased by 1,000,000. The increase in the cultivation of flax amounted to more than 65,000 acres; and of wheat, to 83,000 acres. In the meantime the number of paupers had been largely diminished; and there were fewer paupers in the Irish workhouses by 17,000 than there were at the same period of the preceding year.

In 1857 there were 5,860,089 statute acres under tillage, being an increase of 106,542 acres over the quantity in 1856. This addition to the extent of land under crops is composed of an in-

crease in cereal crops of 2508 acres—in green crops, of 45,637, and of the land under meadow and clover, of 66,634 acres—making in all 114.779 acres, from which a decrease in flax of 8237 acres is to be taken. According to the returns of live stock, there were 600,693 horses in Ireland in 1857, being an increase over the number enumerated in the previous year of 27,285, of which 16,606 were horses used for agricultural purposes; 2446 for traffic and manufactures; 2469 for amusement or recreation; 1779 were yearlings, and 3965 under one year old. Cattle increased by 30,686 between 1856 and 1857; the number returned in the latter year being 3,618,544. The total income of the year amounted to 6,772,982*l.*, and the expenditure to 6,152,017*l.* The amount of the Excise collections in the various revenue districts of Ireland was 2,374,733*l.*; and the gross produce of the customs' duties 2,078,062*l.* The exports to England were 214,636 head of cattle, 8162 calves, 489,494 sheep, 254,054 swine, 170,121 quarters of wheat and flour, and 1,964,655 quarters of oats and oatmeal. The total quantity of proof spirits charged with duty amounted to 7,054,204 gallons, of which 825,348 were for exportation, and the rest for home consumption.

Of the religious establishments in Ireland there are 1397 episcopal churches, 534 Presbyterian places of worship, and 132 registered buildings, of which 56 belong to the Wesleyan Methodists, 22 to the Reformed Presbyterians, 9 to the Baptists, 14 to the Independents, 5 to the Moravians, and 16 to various minor denominations.

IRELAND, REV. DR. JOHN, Dean of Westminster, was born at Ashburton, co. Devon, in 1761. He was the intimate friend and associate of William Gifford, translator of Juvenal; and, like him, he was of very humble origin,—being the son of a butcher in the same town. They were associates in the Grammar School at Ashburton; and Gifford, in the preface to his edition of Ben Jonson, thus alludes to his old friend Dr. Ireland, on his elevation to the deanery of Westminster. 'With what feelings do I trace the words, "The Dean of Westminster!" Five and forty years have now passed over my head since I first found Dr. Ireland, some years my junior, in our little school, at his spelling-book. During this long period, our friendship has been without a cloud; my delight in youth, my pride and consolation in old age!' Dr. Ireland's first promotion in the church was to the vicarage of Croydon, in Surrey, to which he was collated, in 1793, by Archbishop Moore. In 1802 he was promoted to a prebendal stall in the collegiate church of Westminster; and on the death of Dr. Vincent, in 1816, he was installed to the deanery, and also succeeded to the rectory of Islop, which is in the patronage of the Dean and Chapter of Westminster.

Dr. Ireland was not only a warm patron and friend of learning, but he also extensively applied his talents to the walks of literature. In conjunction with his friend Mr. Canning, he was one of the principal writers who aided Mr. Gifford in the early volumes of the 'Quarterly Review.' He was also the author of 'Vindiciæ Regiæ, or a Vindication of the Kingly Office,' 'Paganism and Christianity compared,' 'Nuptæ Sacræ, an Inquiry into the Scriptural Doctrine of Marriage;' with numerous lectures, discourses, and sermons, on a variety of subjects. Having no family he was enabled to apply his large property to the most useful purposes. He was the founder of four scholarships in the University of Oxford, of 30*l.* per annum each. To Westminster School he gave 500*l.*; to the school where he had been educated 2000*l.*; to Oriel College, Oxford, 2000*l.*, for an exhibition; and 10,000*l.* to the University for the Professor of 'The Exegesis of the Holy Scripture.' He also left by his will several large sums in reversion for different charitable objects:—to the Western Dispensary he left 1000*l.*; to the Devon and Exeter Hospital, 2000*l.*; to the Westminster Hospital, 2000*l.*; for a chapel in Westminster, 5000*l.*; to King's College, 2000*l.*; to trustees for poor persons in Ashburton, 1000*l.*; with other liberal bequests and legacies. He died in 1842.

IRON MANUFACTURES and TRADE (vii. 541). Within the last few years the increase in the iron manufactures of this country, their extensive application to the arts, and the great improvements in the various modes of working the raw material, have been truly extraordinary. It appears that the total quantity of pig-iron annually made with pit coal from 1788 to 1856 was more than 60,000,000 tons; and while the total quantity manufactured in 1827 was only 690,000 tons, in 1856 it had increased to 3,586,377 tons, which were the produce of the following numbers of blast furnaces; England, 324; Scotland, 127; Wales, 171; making a total of 622; thus distributed:—

	Tons of Pig Iron.	Furnaces in Blast.
Staffordshire	907,731	167
Shropshire	109,722	27
S. Wales	877,150	162
N. Wales	47,682	9
Yorkshire	275,600	46
Derbyshire	106,960	26
Scotland	880,500	127
Northumberland and Durham	331,370	48
Various	49,662	10
Total	3,586,377	622

The quantity and value of British iron and steel of all kinds exported, from 1792 to May 31, 1857, was not less than 16,987,167 tons, and the value received from foreign countries 179,975,345*l.* sterling. The value of hardware and cutlery exported, from 1805 to 1857, at different periods, is 85,394,864*l.* sterling. The total value of machinery, steam-engines, &c., exported from 1822 to 1857, is 125,92,555*l.* sterling. The total general amount saved by increased export, received from foreign countries, is 290,562,764*l.* sterling.

Mr. J. K. Blackwell, of the Geological Society, states that the annual production of pig or crude iron appears, from a careful comparison of various authorities, to be at the present period nearly as follows:—Great Britain, 3,000,000 tons; France,

750,000; United States of America, 750,000; Prussia, 300,000; Austria, 250,000; Belgium, 200,000; Russia, 200,000; Sweden, 150,000; various German States, 100,000; other countries, 300,000; making a total of 6,000,000 tons.

With regard to the strength of iron, some interesting experiments were lately made by Mr. Clay, in testing, at the Liverpool chain-proving machine, some samples of puddled steel bars, manufactured at the Mersey Works, when it was shown that their average tensile strength was 160,832 per square inch, while the strength of Russian iron is only 62,044; of English rolled iron, 56,532; Low Moor, 56,103; American hammered, 53,913; of tempered cast steel, 150,000.

One of the most useful improvements of modern times is the introduction of *Iron-slitting mills* into this country. The discovery of this process was first made in Sweden; and the consequences, at the time, were most disastrous to the iron manufacturers of Stourbridge. But there was an adventurous spirit, by the name of Foley, a fiddler, who formed the secret determination of ascertaining by what means the process of slitting bars of iron was effected. He accordingly worked his passage to Sweden; and fiddled, and begged his way to the iron foundries, where, after a lengthened period, he became a great favourite with the workmen, and obtained the secret of the art. But on his arrival in England it was found that his machinery would not work; and he visited Sweden a second time, and had the good fortune to be lodged in the slitting mill itself, where he discovered the causes of his failure; and his second attempt in England was crowned with complete success. Thus by his persevering application did he succeed in enriching himself, and benefiting his countrymen.

In America a great improvement has been lately made in the coating of iron with metallic alloys; by which iron bolts, bars, spikes, &c. are prevented rusting or oxidizing. It consists in the preparation of iron to receive the coating by immersing it in concentrated mineral acids. As soon as the articles to be cleansed are immersed in the acid, one, two, or more small pieces of spelter are dropped among them, or the spelter is passed into the acid with the articles. The acid acts at once and rapidly on the spelter, holds in solution what it dissolves, and precipitates a film of it on the minutest portion of the iron surfaces the instant the acid has cleansed them, and this film protects such portions from any further action of the acid.

A new and ingenious process of manufacturing malleable iron and steel without fuel has been lately patented by Mr. Bessemer. Its essential feature is, that he takes crude iron directly from the ordinary blast furnace, and in the space of thirty minutes converts it into ingots of malleable iron or steel of any size, and fit for the various manipulations ordinarily employed to adapt them to all the material purposes to which they are now applied. He thus dispenses with all the intermediate processes to which recourse has been had to produce the same effect within the last seventy years; and by a simple stream of cold air entirely supersedes the old process of puddling. The saving thus effected will be immense. The cost per ton of bar iron will be reduced from 8*l.* 10*s.* to 6*l.*; and of steel from 20*l.* to 6*l.*

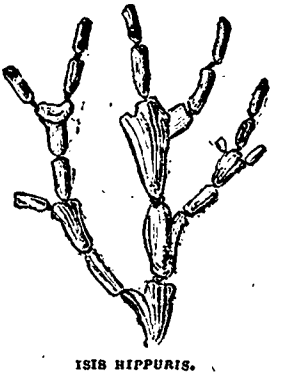
Among the various applications of iron to the arts, may be noticed Paper, Lighthouses, Ships, Steamers, &c. [Lighthouses, Paper, &c.]

I'SATINE, a chemical compound, which forms orange-red or hyacinth crystals of a brilliant lustre, and is obtained by means of sulphuric acid and bichromate of potash, from oxidized indigo. This compound dissolves in caustic potash, and the liquid yields, on evaporation, Isasite of potash as a crystalline salt. 'This salt gives with acetate of lead a white precipitate, Isatate of lead, which, when decomposed by sulphuretted hydrogen, yields a solution of the acid. Isatic acid is decomposed from this solution by spontaneous evaporation, as a white powder.' (Turner.)

I'SERINE. [Titanium.]

I'SIA, certain festivals held among the Romans in honour of Isis, the Egyptian goddess. They were originally brought from Egypt, but on account of their licentiousness were suppressed, A. R. 696; though they were restored by Commodus about 200 years afterwards. The priests were called *Isiaci*.

ISIS HIPPU'RIS, a genus of corals inhabiting the Indian seas, the axis of which is formed of a series of calcareous joints, united together by horny rings. It belongs to the family *Gorgonidæ*, which constitutes the third family of asteroid polypes.



ISIS HIPPURIS.

Most of the species possessing a horny axis grow in a more or less arborescent form. But in some species the longitudinal branches are united at regular intervals by a number of transverse pieces, which are composed of a continuation of the horny axis, and bear polypes like the main stem and branches. (Dallas's *Zoology*.)

ISLANDS. The formation of islands, at different periods, is among the most remarkable phenomena in the great history of nature. Some have arisen from the coral beds in the bosom of the ocean [Coral Islands, *Supplt*], and others from volcanic action, or the operations of the central fires of the globe, by which the primary rocks of the earth's crust, with their superincumbent depositions, have been raised from their innermost depths to the surface of the ocean. Of

this, innumerable evidences have presented themselves both in ancient and modern times. Within the period of authentic history several small islands have been known to emerge from the depths of the gulf of Santorin, in the Grecian Archipelago. Nearly two centuries before the Christian era the small island of Palaia Kameni made its appearance; and in the year 1573 the Little Kameni was thrown up, amidst a cloud of vapour and the discharge of pumice stone. In 1707–9 another island, the result of submarine volcanic action, suddenly made its appearance, called the New Kameni, which still sends forth sulphureous vapours. There is an instance, mentioned by Kircher, of an island connected with the Azores, which was thrown up in 1538; and another in 1587, when an earthquake agitated the island of St. George; and near its shores arose eighteen small islands. There are instances where islands, after suddenly rising into existence, have begun to subside, and then gradually disappeared, or remained as shoals just below the surface of the water. Of these temporary islands, the most curious is that of Sabrina, in the neighbourhood of the Azores, which, in 1811, emerged from the deep near the coast of St. Michael. It first arose from a depth of 240 feet, and formed a dangerous shoal. Then presenting itself above the surface of the water, it continued rapidly to emerge for several days, until it rose to the height of 300 feet, and formed an island of about a mile in circumference. In its centre there was a beautiful crater, from which hot water was poured into the sea. In a few months it began gradually to subside, and in February 1812 no trace of the island remained; but in 1813, where Sabrina once stood, there was a depth of 500 feet. In the year 1783 an island was formed by elevation about seventy miles from Cape Reykiawas in Iceland. It consisted of lofty cliffs, which emitted smoke and fire, with immense quantities of pumice, which covered the sea for above a hundred miles around. The king of Denmark laid claim to this newly-formed territory, and called it 'New Island;' but before the expiration of a year, it made its disappearance, leaving nothing but a rocky reef to denote the spot where the island stood.

The formation of many islands, which still remain to attest their volcanic origin, is within the records of authenticated history, while others are standing memorials of the many changes and convulsions which have marked the different superficies of the globe for countless ages before history commenced its annals, or the wonderful phenomena of nature had any intelligent witness. In the great Indian and Pacific oceans these volcanic operations have been constantly at work; and islands have been thus formed, where the great ocean had rolled for ages uncontrolled. Barren Island, in the Indian Ocean, has been considered as one of the most remarkable volcanic formations now in existence. It is about six leagues in circumference, and emits, from a central cone about 1800 feet high, showers of red-hot stones, of three or four tons in weight, which are thrown to a distance of many hundred feet beyond the range of the island. The surrounding sea appears of unfathomable depth. In 1806 a new island arose, among the Aleutian group of the North Pacific, about four miles in circumference, which has remained immovable ever since; and in 1814 another isle made its appearance in the same neighbourhood, which, after rising 3000 feet in height, slightly subsided, and has ever since remained firmly fixed as one of the Aleutian group of islands; all of which, beyond the possibility of doubt, have originally emerged from the bosom of the ocean, though perhaps for ages before the records of history.

ISLINGTON (or METROPOLITAN) CATTLE MARKET, a spacious area of ground for the sale and purchase of cattle, sheep, pigs, &c., situated on the ancient site of Copenhagen Fields, and occupying an extent of seventy-five acres. It originated from the compulsory abolition of Old Smithfield Market, which, from the ever-augmenting population of the metropolis, had become a serious nuisance. The first stone was laid in March 1854; and the new market was opened on the 13th of June 1855. Mr. Bunning was the architect, and Mr. Wilson the builder. Abattoirs, lairs, good roads, and covered markets for calves, pigs, &c., form a portion of the general design. Convenient banking houses are placed in the middle of the market; and out of the centre of these springs a lofty and handsome clock tower. Accommodation is provided for 34,980 sheep, 1749 pens, and 13,232 feet of rail for the tying of 6616 bullocks. The pig and cattle markets, which are situated on the west side of the quadrangle, afford accommodation for 1425 calves, and 900 pigs. West of the market, lairage is provided for 8160 sheep, and on the south, for 3000 bullocks; and there are water posts at given distances. There are likewise several commodious taverns, with every convenience and appliance for the graziers, dealers, and butchers. The whole was erected by the city of London at a cost of about 450,000*l.*

ISTIU'RUS (Gr. *ἱστίον* a sail, and *οὐρὰ* a tail), a genus of Saurian reptiles, of the family *Iguanidæ*.

ITALY. With the exception of Rome and Lombardy, there has scarcely been any popular effort to emancipate this beautiful country from the paralysing influence of Papal and Austrian thraldom. [ROME, *Suppl.*] The entire population at this time may be estimated at about 24,000,000; thus apportioned:—The Romish or Papal States at 3,100,000; Sardinia, 4,776,034 souls; the Lombardo-Venetian Kingdom, 4,916,347; Italian Tyrol, 495,204; Canton of Ticicino, 129,313; Duchy of Parma, 511,969; Duchy of Modena, 606,139; Grand Duchy of Tuscany, 1,817,166; and the kingdom of the Two Sicilies, 8,616,922.

IVORY PALM, one of the finest productions of the vegetable kingdom (*the Phytelephas macrocarpa* of botanists), sometimes called *Vegetable Ivory*. It is an inhabitant of the Magdalena, in New Grenada; and the seeds constitute a substance so much like ivory, that they have become an important article of commerce; and are used for the manufacture of trinkets and other articles resembling ivory.

J.

JACOB, WILLIAM, F.R.S., formerly a merchant of London trading to South America, was born in 1763. In 1810 he was elected Alderman of London; and sat in parliament from 1808 till 1812 for the borough of Rye. During the agitation of the corn-law question he acquired considerable celebrity, from his various reports and useful works on that important subject. The principal of these were his 'Inquiry into the Causes of Agricultural Distress;' 'Considerations on the Protection required by British Agriculture;' 'View of the Agriculture, Manufacture, Statistics, and State of Society of Germany, France, &c.;' 'Tracts relative to the Corn Trade and Corn Laws;' and many similar works. It was Mr. Jacob's great industry and care, in collecting and epitomizing the returns and averages connected with the corn-law question, that gained him the appointment of Comptroller of Corn Returns, which he held from 1822 to 1842, when he retired on a pension. He died in 1852.

JAC'OBINS, one of the revolutionary factions of the French revolution of 1789, who took a prominent and violent part in the sanguinary proceedings of the National Convention. They were so called from the Jacobin monastery, which was their place of meeting.

JAC'OBITES, in ecclesiastical history, a sect of Christians who flourished in Syria and Mesopotamia. They were founded by one Jacob, a monk, A.D. 550, and maintained that Jesus Christ had only one nature.—In English history, it was a term applied to those supporters of James II. and the Stuart family, who disavowed the Revolution of 1688, and vindicated the doctrine of passive obedience to princes.

JAMESON, ROBERT, Regius Professor of Natural History in the university of Edinburgh, was born at Leith in 1773. At an early age he devoted himself to the study of the various sciences connected with natural history. In his twenty-fifth year he brought out his 'Outlines of the Mineralogy of the Shetland Islands,' &c.; and in 1800 appeared his 'Outlines of the Mineralogy of the Scottish Isles.' He afterwards became a disciple of the celebrated Werner, and, in grateful commemoration of his peculiar merits, he founded the Wernerian Society, a body which has rendered considerable service to natural science. On the death of Mr. Walker, in 1804, Mr. Jameson was appointed to the Edinburgh chair of natural history; and in 1808 he published his 'System of Mineralogy, comprehending Orychtognosy, Geognosy, Mineralogical Chemistry, Mineralogical Geography, and Œconomical Mineralogy;' which work was republished in 1816. In 1819, in concert with Sir David Brewster, he commenced the publication of the 'Edinburgh Philosophical Journal;' of which, at the end of the tenth volume, he became sole editor, and conducted it, with great ability, to the day of his death. As Keeper of the University Museum his duties were of the most onerous description. The vast collections of all the branches of natural history were enormous. It is stated that in this colossal repository of science, there were under the curator's charge 40,000 specimens of rocks and minerals, which he had geographically arranged; 10,000 specimens of fossils; 800 specimens of crania and skeletons; 8000 birds; 900 fishes and reptiles; 900 invertebrate animals; and 300 specimens of recent shells. He died in 1854.

JAMESONITE, a mineral of a grey colour, so called in honour of Professor Jameson. It occurs massive, and crystallized in four-sided oblique prisms. Its specific gravity is 5·56; and its constituents—lead, 40·00; antimony, 34·26; sulphur, 22·34; iron, 2·64; copper, 0·14.

JAPAN (vii. 598–601). In 1856, some important concessions were made to the nations of the West. At a solemn assembly of the principal functionaries of the State, held at Jeddo, in June of that year, it was decided that two ports of the empire, Nangasaki and Hakodadi should be open to the vessels of all nations, where they might at all times repair, and take in provisions, establish depôts of coal, &c. It was also agreed that every port of the empire should be accessible to vessels in distress, where they might take refuge, but again put to sea when the danger was over. No foreigner, however, was to be allowed to penetrate into the interior of the country without special permission. In 1858 the Americans succeeded in negotiating a treaty of commerce of a very favourable character. It provided for a resident minister at the court of Jeddo, and for the opening of the ports of Kangawa, Nangasaki, and Hakodadi, within the term of one year from the date of the treaty; while the principal cities of Jeddo and Ohosaka were to be thrown open to trade. In the summer of the same year, Lord Elgin, on the part of Great Britain, and Baron Gros, on behalf of France, having concluded the treaty of Tien-Sin with the Emperor of China [PEKIN, *Suppl.*], proceeded to Japan, accompanied by a large squadron, for the purpose of there negotiating a treaty of commerce, that should be reciprocally beneficial to the Eastern and Western worlds. In this object they happily succeeded; and a treaty was signed, containing, in many respects, the same provisions as the American one. It was signed in due

form at Jeddo, on the 26th of August, 1858, and its principal stipulations were—that diplomatic agents should reside at Jeddo and London, with the right of travelling freely to any part of the empire; that the ports of Hakodadi, Kangawa, and Nangasaki are to be opened to British subjects on the 1st of July, 1859, and Hiogo on the 1st of January, 1860. British subjects may permanently reside in all the foregoing ports, lease ground, purchase or erect dwellings and warehouses, but not build fortifications. They are also permitted to go from twenty to thirty miles around their places of location. From the 1st of January, 1862, they will be allowed to reside at Jeddo; and, from the 1st of January, 1863, at Ohosaka, for the purposes of trade. Cotton and woollen fabrics are only to pay a duty of five per cent. of the declared value on importation. Almost all other articles are to pay a duty of twenty per cent. After the 1st of July, 1872, it is agreed that the tariff shall be subject to a general revision.

Thus the ancient empire of Japan, which for ages has rigidly excluded the Western nations from all commercial intercourse, has at length entered into the great family of European civilization and commercial enterprise.

JASPER, a precious stone, somewhat similar to agate, of which there are various kinds. The green, spotted with red, or those which approach to a carnation or purple colour, are held in the highest estimation. The florid jasper, found in the Pyrenees, is usually stained with various colours, as red, green, &c. The ancient arrow-heads, spear-heads, and other Indian implements of stone for use in war or the chase, were principally formed of native blood-red jasper, which was exceedingly hard and fine.

JAVELIN, among the classical ancients, a spear-like missile used both by the cavalry and infantry. It was sometimes five feet in length, and in a charge was darted at the enemy, often with destructive effect.

JAY, REV. WM., a learned dissenting minister, was born at Tisbury, Wilts, in 1769. In 1791 he was appointed pastor of Argyle chapel, Bath, and held that position for the period of sixty-two years. Besides the numerous sermons of which he was the author, he published an 'Essay on Marriage,' 'Lectures on Female Scriptural Characters,' and other works of a biographical character. His reputation as an eloquent preacher was very great. He died in 1853, aged 84.

JEDDAH, or JIDDA, a city of Arabia, situated on the east coast of the Red Sea, near Mecca, and a great entrepôt for foreign commerce. It has lately rendered itself notorious for the savage butchery of the Christian residents, including the English and French consuls, for which ample retribution was exacted by the bombardment of the town, and the public execution of eleven of the murderers. Although the resident population does not usually exceed five or six thousand, the number is usually increased by the influx of strangers on their pilgrimage to Mecca. Its public buildings are but of a mean description. The governor's house, a small castle, with nine or ten guns, five mosques, and a few handsome Khans, are all that claim attention. The town, however, is one of the holy places of the Mahomedan faith, and its sanctity is increased by the reputed tomb of Eve being in the neighbourhood. 'The caravans of Mecca,' says MacCulloch, in his 'Geographical Dictionary,' 'start daily; those to Medina, every forty to fifty days; the trade in grain is monopolized by the Egyptian government. Twice at least in every year Djidda is inundated with inhabitants—viz. on the arrival of the Indian fleet (about May), when merchants from all quarters pour in to purchase at the first hand, and during the hadj, when pilgrims come from all the African ports in vast numbers. In 1831 above 20,000 pilgrims landed either at Djidda or Yembo, but mostly at the former. There is no manufacture in the town. Everything, for use as well as for consumption, is imported, and the occupations of the poorer as of the richer inhabitants consist almost exclusively of barter.'

JEFFREY, FRANCIS LORD, a distinguished lawyer and man of letters, was born at Edinburgh in 1773; and educated at the High School. He was for four years under the care of Mr. Luke Fraser, and afterwards, in 1785, was placed under the rector Dr. Adam, the celebrated author of 'Roman Antiquities.' In 1787 he was sent to the University of Glasgow, and attended the Greek classes under Young, and the logic classes under Jardine. In 1794 he was called to the Scottish bar; and subsequently joined with a few friends in establishing, in 1802, the 'Edinburgh Review,' of which he was the leading editor for a period of twenty-seven years. In 1830 he was appointed Lord Advocate of Scotland; and after the passing of the Reform Bill was chosen member for Edinburgh; but he never shone much as a parliamentary debater. In 1834 he was raised to the judicial bench; and here he so distinguished himself by his supereminent qualities, as a lawyer and a scholar, that he has been admitted by all parties to be one of the ablest judges that ever adorned the bench of Scotland. He died in 1850.

JELLALABAD, a small town of Affghanistan, situated in the valley of the Cabul River, about sixty miles W.N.W. of Peshawur. It is rendered memorable by the gallant defence made by a brigade of British troops under General Sir Robert Sale, in 1842, against the attacks of large hordes of Affghans under Akbar Khan. When this brigade was retiring to India from Cabul, it threw itself into this dilapidated town, and immediately intrenched the place in a manner sufficiently strong to defy the attacks of the Affghans for several months. Even when the parapets of the intrenchments were destroyed by a violent earthquake, the officers proceeded, with amazing resolution and perseverance, to reconstruct the defences, and thus defy the repeated assaults of the enemy. At length, General Pollock, with a large force, advanced to the relief of Jellalabad; but before his arrival the brave garrison had wrought its own emancipation by a very gallant sortie, in which the invading enemy was signally defeated, and compelled to retreat. On the conclusion of the

Affghan war Jellalabad was evacuated, after the mud walls and temporary fortifications had been destroyed by the British. The gallant brigade, who had so heroically defended the place, on its triumphal return to India, was received with distinguished honours, and greeted by the governor-general as 'The Illustrious Garrison of India.'

JERROLD, DOUGLAS, the distinguished dramatist and journalist, was born in London, in 1803. His father was the manager of a theatre at Sheerness; but it does not appear that the stage, at that early period of his life, had any attractions for him; for he entered the navy as a midshipman under Captain Austen, brother of the well-known novelist, Miss Austen. At the conclusion of the war, however, he had to select another profession; and he was placed as an apprentice with a London printer. Here he devoted himself to the study of languages, and to literary pursuits. Shakspeare was his favourite author. His first impulse for dramatic writing was the favourable reception of a critique on the opera of Der Frieschutz, which he had written for the newspaper on which he was employed as a compositor. Before he was twenty he wrote several dramatic pieces; among others 'More Frightened than Hurt,' which was performed at Sadler's Wells, and still keeps the stage. He was then engaged by the manager of the Coburg Theatre to produce pieces at a salary; but he soon afterwards went to the Surrey, for which he produced the celebrated naval melodrama of 'Black-eyed Susan,' which had a wonderful run, and completely retrieved the fallen fortunes of that house. It also largely contributed to the fame and independence of T. P. Cooke, who played the principal character. It was afterwards performed for many hundred nights, on the boards of the theatres royal; and had the run of nearly all the provincial theatres; but, after all, the author's share of the immense profits thence arising did not exceed 70*l.* Jerrold now devoted his pen almost exclusively to dramatic compositions, and among other pieces he brought out 'Nell Gwynne,' 'The School-fellow,' 'The Housekeeper,' Bride of Ludgate,' 'Mutiny at the Nore,' and the 'Rent Day;' the last of which, founded on one of Wilkie's celebrated pictures, had a considerable run, and proved a source of profit to the author. Soon afterwards appeared his comedies of 'The Prisoner of War,' 'Bubbles of a Day,' 'Time works Wonders,' and other pieces, which were played, with considerable success, at the Haymarket and the Princess's. His talents, however, were not confined to the drama; he applied them, in a variety of ways, to numerous compositions of a light and agreeable character, which were chiefly contributed to the magazines and newspapers. In Blackwood appeared his 'Men of Character,' and 'The Chronicles of Clovernook' in the 'Illuminated Magazine,' of which he was editor. His ready wit appeared also in the various numbers of 'Punch;' as in 'Punch's Letters to his Son,' and the 'Caudle Lectures.' He was afterwards engaged, at the earnest desire of the proprietor of 'Lloyd's Newspaper,' to undertake the editorship of that Journal at 1000*l.* per annum. It is stated that on the assumption of Jerrold's name, this journal, during the first week, received an accession of 25,000 subscribers. He died in 1857, and was interred in the Norwood Cemetery.

JET. [Coal, *Supplt.*, p. 302.]

JEWS (*vii.* 625-9). During the session of 1858, such amendments were made in the abjuration oath as were calculated to admit the Jews into Parliament. After a long struggle the House of Lords renounced their opposition by introducing a bill, in which they agreed to omit the words 'upon the true faith of a Christian,' as recited in the 'abjuration oath,' provided, at the same time, that this omission received the assent of the majority of either House previous to the introduction of any Jewish member. It was, in fact, a bill for enabling the House of Commons to admit or reject Jews by resolution.

JOA'CHIMITES, a sect of heretical Christians of the thirteenth century, founded by Joachim, abbot of Flora, in Calabria, who was esteemed a great prophet while he lived, and left behind him several books of prophecy. Their tenets were formally condemned by the councils of Lateran and Arles in 1215 and 1260.

JOHNSTON, JAMES, Professor of Chemistry in the University of Durham, F.R.S., &c., was born at Paisley in 1796. He was originally a schoolmaster at Durham; but directing his mind to the study of chemistry, he went to Sweden, and placed himself under the celebrated Berzelius, with whom he made so much progress, that soon after the establishment of the University of Durham he became in 1833 Professor of Chemistry. Here he closely devoted himself to chemical literature. His 'Lectures on Agricultural Chemistry and Geology,' and his 'Catechism' on the same subject, have had a world-wide reputation. But one of the most popular of his works was his 'Chemistry of Common Life,' which has had a very extensive circulation, and has largely contributed to diffuse a general knowledge of the principles of chemistry as connected with the occupations of ordinary life. He died in 1853.

JOINT-STOCK COMPANIES (*vii.* 638-9). In 1854 an Act was passed for the regulation of Joint-Stock Companies, so far as to protect individuals from being called upon to bear the entire responsibility of the company's liabilities. It has been designated the 'Limited Liability' Act, by which it is provided that individual shareholders shall only be responsible for the amount of their respective shares.

JONES, GENERAL SIR JOHN T., K.C.B., historian of the war in Spain, was born in 1783, and first obtained his commission in 1798, in the Royal Engineers. He distinguished himself in various campaigns, especially in the Peninsula under the Duke of Wellington, and in 1837 he became a general officer, and K.C.B. He was the first officer who published a history of the war in Spain. His 'Journals of Sieges in Spain,' which is a storehouse of military information, was first published in 1813; and has since passed through various editions. He died at Cheltenham in 1843.

JONGLEURS, the name of those itinerant

musicians, who in the Middle age were very numerous in France. They wandered about from province to province, singing, and performing on the flute, violin, or other instruments, at the courts of princes and nobles, by whom they were often liberally rewarded. They were something like the early troubadours or bards; and one of their earliest employments was to attend and perform for these troubadours, who, from deficiency of musical knowledge, were unable to sing their own compositions.

JOURDAN, MARSHAL, a soldier of fortune in the French army, and one of Napoleon's favourite generals. He first entered the army as a private soldier in 1778; became a chef-de-bataillon in 1791; and soon rose to be general of division. In this position he successfully commanded the armies of Ardennes, the North Moselle, the Sambre and Meuse, the Danube and Italy; and was present at the battles of Wattignies, d'Arlon, the capture of Charleroi, the battles of Fleurus and d'Aldenheren, the capture of Bruxelles, Namur, Louvain, Liege, Cologne, Frankfort, the passage of the Rhine, &c. He was governor of Naples in 1806, having been perviously created a marshal of the empire. In 1811 he was governor of Madrid, and major-general to the king of Spain, Joseph Bonaparte, with whom he sustained a terrible defeat at Vittoria, by the allied troops under the Marquess of Wellington. After this he retired from active military duty, and remained so with little interval until the restoration of the Bourbons, when he became a count and a peer of France, general-in-chief of the army of the Rhine, governor of Les Invalides, &c. He died at Paris in 1833. (*Mil. Cyl.*)

JU'BILEE, among the Jews, an important period of time, which occurred every seven times seven years, or rather every fiftieth year, when all slaves were set free. Those who had mortgaged their lands retook possession, and general rejoicings took place. In the year 1300, Pope Boniface instituted a sort of Jubilee, to be observed once in every 100 years, when he granted a plenary indulgence and remission of sins to all who visited the churches of St. Peter and St. Paul at Rome, and remained there for fifteen days. The periods were afterwards remodified by Clement VI. in 1350, to fifty years; by Urban IV. in 1839, to thirty-three years; and by Sixtus VI., to twenty-five years.

JUDGE-ADVOCATE, in military matters, an important functionary appointed to officiate as public prosecutor on every general court-martial formed for the trial of officers and soldiers accused of a breach of the Articles of War. There are different kinds of judges, as the judge-advocate-general, who is appointed under the sign-manual; the judge-advocate, deputed by commission from the crown; the deputy-judge-advocate, acting under the authority of the judge-advocate-general; and the officiating judge-advocate, who is appointed by commanding officers abroad. The judge-advocate of the forces stationed in London is regarded as a civil officer, and allowed a salary from the civil department. The office is generally held by an experienced barrister in the confidence of the crown. The duties of a judge-advocate are to register and record all the acts of a court-martial, and all the evidence, as nearly as practicable, in the exact words of the witnesses; to advise the court on points of law, of custom, and of form; and to call their attention to any deviation from the strict rules of order. It is also his duty to note down the opinion of each member of the court-martial as he delivers it, whether for or against the prisoner; but he is bound not to disclose the vote or opinion of any particular member.

JUDGES (vii. 650). The number of judges for the administration of the laws in our superior courts has been increased. Connected with the new Court of Divorce there is the judge of the Court of Probate, officially styled the 'Judge Ordinary' [DIVORCE, *Supplt.*]; and by the Statute 14 and 15 Vict. c. 83, there were created two Lords Justices of Appeal in Chancery, intended to assist the Lord Chancellor in the decision of appeals from the Master of the Rolls and Vice-Chancellors. But the Lord Chancellor may sit with them, or they may adjudicate separately as a Court of Appeal. In matters of lunacy they have the same authority, by sign manual, as the Lord Chancellor; and in bankruptcy they constitute the Court of Appeal. The lords justices also possess an original jurisdiction, which enables them to hear causes in the first instance, when all the appeals are disposed of.

JUGUM, among the Romans, a humiliating kind of punishment inflicted on their vanquished enemies. It consisted of two upright spears, with a third laid across, in the shape of a gallows; when those who had surrendered themselves as prisoners of war were compelled, by way of ignominy, to pass under the erection without arms or military accoutrements.

JULIS, a genus of Labroid fishes, remarkable for its various colours. It is distinguished by its smooth head, and gill-covers without scales. Mantell, in his 'Geology of Sussex,' conjectures that the more tortuous kinds of coprolites, long known by the name of Juli, may have been fossil fir cones.

JUNGERMANNIA. [LICHENS, *Supplt.*]

JUNOT, MARSHAL, DUC D'ABRANTES, was a soldier of fortune, who first attracted Napoleon's attention by his bravery in the field. He was born at Bussy-le-Forges in 1771. He first began to study for the law; but the political events of 1791 induced him to enlist in the battalion of volunteers raised in the department of Coté d'Or. He served under Bonaparte at Toulon, where he became a captain, as well as aide-de-camp to Napoleon. He accompanied Bonaparte to Italy in 1796; and to Egypt in 1799. Having greatly assisted him, on the 18th Brumaire, in overthrowing the Directory, he was made commandant of Paris, and created general of division in 1801. Eventually, under the patronage of the emperor, he became Duc d'Abrantes, and a Marshal of France. To him was entrusted the task of invading Spain and Portugal in 1807–8, where for some time he exercised his military tyranny; but at length he was signally defeated by Sir Arthur Wellesley, at the battle of Vimiero, and compelled to evacuate the

country. From this period he lost favour with Napoleon, and was refused employment in the campaign of 1813. Shortly afterwards his mental faculties became disordered; and he died in 1813.

MADAME, DUCHESS OF ABRANTES, wife of Marshal Junot, after the fall of Napoleon, was obliged to support herself by the efforts of her pen, in consequence of all the family estates being confiscated. Her principal work was 'Mémoires au Souvenirs historiques sur Napoleon,' published in 1831, which had a prodigious sale. But she was at length reduced to extreme poverty, and retired to a maison de santé, where she died in 1838.

JURIES, SPECIAL AND COMMON (vii. 667–71). If we are to believe Judge Blackstone, the law of England is 'the perfection of reason;' but if we examine some points of its practice we shall find them often repugnant to common sense. Thus in the case of juries there is a strange and anomalous difference between *Special* and *Common;* but the reasons for that difference are practically absurd. The *special* jury is composed of opulent men, with abundance of leisure, and therefore, by a strange perversion of reason, they receive a fee of one guinea each; while the *common* jury is constituted of farmers, shopkeepers, and working tradesmen, whose time to them is all-important, and therefore (by the rule of contraries, as it were), they are paid 8*d.* a trial in civil cases, and nothing in criminal ones!

The common jury cases often involve intricate points, requiring intelligence and discrimination; but special jurymen, though of superior education and experience in judicial matters, are altogether exempt from serving on a common jury. In the provinces the farmers and traders are liable to be called upon a common jury six or eight times in the course of the year, although their time to them is their property! but gentlemen and landowners are entirely exempt from such attendances, although they have nothing to occupy their time! How long will such an inconsistent state of things exist? How long will the unfortunate suitor be compelled to pay for the services of the rich, while the poor tradesman goes unremunerated?—As Mr. Justice Coleridge once pointedly observed, in addressing the grand jury of the county of Durham, 'the special juryman was enjoying a privilege at the expense of his poorer neighbour without the sanction of the law;' and he therefore thought 'it was absolutely necessary that the common juries should be drawn from the whole jurors' list of the county.'

JUSTICES, LORDS, OF APPEAL IN CHANCERY. [JUDGES, *Suppl.*]

JUSTS, or JOUSTS, martial exercises or private combats which took place during the Mediæval periods between knights and other distinguished persons of martial spirit. They differed, in some respects, from tournaments, which consisted of many men in troops, while justs were contentions between man and man. On some occasions the combatants were on foot with spears, swords, or axes, and a barrier of wood breast-high between them. In the Middle age, these justs were often the mere private combats of chivalry, and became authorized by custom as trials of military prowess.

K.

KAMENIS. [ISLANDS, *Suppl.*]

KANE, DR. ELISHA KENT, was the son of Judge Kane, and born at Philadelphia in 1820. He was educated in the university of Virginia, and graduated as M.D. in the university of Pennsylvania. He soon distinguished himself in the various public missions to which he was subsequently appointed. In 1842 he was selected for the American mission to China, and visited the interior of Ceylon. In the island of Luzon he descended to the bottom of the great crater of Tael, upwards of 200 feet. He afterwards visited Hindustan, Egypt, Greece, and the west coast of Africa. On his return to America he was actively engaged in the Mexican war; and afterwards attached to the United States' expeditions in favour of Sir John Franklin, as senior medical officer. In the second expedition, the *Advance*, which was placed under the command of Dr. Kane, was frozen up during *twenty-one months*. The crew were eventually compelled to abandon the vessel, and travel 1300 miles over the desolate wilds of the Arctic regions, before they reached the Danish settlements of Upernavik. A very interesting account of this expedition was published by Dr. Kane, entitled 'Arctic Explorations: the second Grinnell Expedition in Search of Sir John Franklin, in 1853-55.' In May 1856 the Royal Geographical Society awarded him their gold medal, 'for his distinguished services and important discoveries in the polar regions, and for his valuable memoir and charts.' He died in 1857.

KANSAS, an extensive territory of the United States, which was annexed by an Act of Congress, together with the territory of Nebraska, in 1854. It extends from the 37° of N. lat. to 40° N., and from the west boundary of the Missouri to the crest of the Rocky Mountains. Its area is about 122,000 square miles. It is chiefly drained by the rivers Kansas and Arkansas. On the east border the territory is peopled by semi-barbarous tribes of Indians, and westerly by wandering tribes. The population, in 1836, was estimated at 36,000. The introduction of slavery into this State having been left an open question by Congress, to be determined by the American settlers

themselves, it has already been productive of much violence in the Kansas, and considerable discord among the members of Congress.

KAR'PHOLITE (Gr. *κάρφω* to shrivel, and *λίθος* a stone), a mineral of a straw colour, which occurs in minute crystals and silky fibres. It is sufficiently hard to scratch fluor-spar, although it may be scratched by felspar. Its specific gravity is 2·93; and its constituents—silica, 36·15; alumina, 28·70; water, 10·78; oxide of manganese, 19·16; oxide of iron, 2·29; fluoric acid, 1·47; lime, 0·27.

KARS, a fortified city of Turkish Armenia, 85 miles N.E. of Erzeroum, population about 12,000. It has been rendered memorable by the siege it sustained during the last Russian war, under General Williams, who had been appointed her Majesty's commissioner with the Turkish forces in the East. In the assault made, in September 1855, the Russians were repulsed with great slaughter; but the brave garrison, being eventually reduced to starvation, were obliged to capitulate. At the treaty of Paris, however, which took place in 1856, Kars was evacuated by the Russians, and restored to the dominion of the Porte.

KEANE, RIGHT HON. LORD JOHN, G.C.B., was the second son of Sir John Keane, of Belmont, co. Waterford, and born in 1781. He entered the army as an ensign in 1793; and, after passing through the subordinate grades of military rank, he acted as aide-de-camp to Major-General Lord Cavan, during the campaign in Egypt. In 1809 he served the campaign of Martinique, and was present at the siege of Dessaix. In 1812, being then a full colonel in the army, and lieutenant-colonel in the 60th Foot, he was sent to Madrid, where his reputation was such that he was entrusted with the command of a brigade in the third division, in which he served until the end of the war with France in 1814, and was present at the battles of Vittoria, the Pyrenees, Nivelle, Orthes, Toulouse, &c. In 1814 he attained the rank of Major-General, and was rewarded with the Egyptian medal and other decorative honours. Sir John was afterwards engaged in the attack on New Orleans, and subsequently passed eight years in Jamaica as commander-in-chief of the forces. In the year 1833 he was appointed commander-in-chief of the army in Bengal; and in 1838 he succeeded Sir Henry Fane in the command of the forces operating in Scinde, and the north-western parts of India. He was now engaged in conducting the operations of a considerable army, with important objects to attain. The difficulties and successes which attended the British army under his command, and the memorable victory of Ghuznee, are well-known matters of history. [HINDUSTAN, AFFGHANISTAN; SCINDE.] In 1839, on the termination of this campaign, Sir John Keane was raised to the peerage, with a pension of 2000*l.* a-year for his own life, and that of his two immediate successors in the peerage. He also received the thanks of the East India Company, and of both Houses of Parliament. He died in 1844.

KEATE, REV. DR. JOHN, Rector of Hartley Westpal, co. Somerset, and many years headmaster of Eton School, was born at Wells, in 1773. In 1784 he was elected on the foundation of Eton School, when only eleven years of age. He afterwards graduated at Cambridge; and while there carried off four of Sir Wm. Browne's medals. After having been many years an assistant master at Eton, in 1810 he became head master, and received the degree of D.D. by royal letters mandatory. In 1820 he was appointed canon of Windsor. In the words of a contemporary writer, 'During nearly a quarter of a century, Dr. Keate guided the studies and preserved the discipline of his school with unparalleled success. The vigour and accuracy of his scholarship, particularly in composition, was not more remarkable than his modesty; and the extent of his mental powers was less known than it might have been, only because a strong sense of duty disposed him to concentrate their whole force on the instruction of his scholars.' He died in 1852.

KEENERS, the name of the Irish Singing Mourners, who were once celebrated for their musical art, when exercising the last funeral offices to their departed friends. The body of the deceased was placed on a bier, ornamented with flowers, when the relations and keeners ranged themselves at the head and foot of the corpse. Then the chief bard, accompanied by the harp, sang the first stanza of the *Caoinan*, or funeral song; after which, the semi-chorus, at the foot of the bier, began the *Ullaloo*, or funeral lamentation, in which they were responded to by the semi-chorus at the head, and then both united in one general chorus. After this, the chief bard of the foot semi-chorus began the second *Gol*, or lamentation; this was answered by the head chorus, and followed by the full chorus. These songs and choruses were performed during the night, and often produced a solemn and harmonious effect. Something like an imitation is still preserved among the lower Irish; but the modern *keeners* consist of a motley multitude of men, women, and children. The old funeral song and chorus have degenerated into mere hideous howling, of which the modern Irish *wake* affords a sample. (Busby's *Dicty. of Music.*)

KEEPS, in the feudal ages, strong towers in the middle of any fortification, to which the besieged resorted in the last extremity. They were similar to what the classical ancients called the citadel, or inner fort, a term which is still applied to modern fortification.

KELLERMANN, FRANÇOIS CHRISTOPHE, DUC DE VALMY, Marshal of France, and one of the most distinguished of Bonaparte's generals, was born at Strasburg in 1735. He entered the Conflans legion when seventeen years of age, and in 1788 rose to the rank of quarter-master-general. The French revolution opened a new field for his military career. In 1792 he became general-in-chief of the army of Moselle, and in November of the same year commander-in-chief of the army of the Alps and Italy. He was principally employed at the head of the cavalry, of which he became inspector-general in 1798. In June 1799 he was

sent to command the French troops in the Batavian republic. Returning to France he followed the fortunes of Napoleon, was with the army of reserve in 1804–5–6, and accompanied Bonaparte to the Rhine and into Germany. He was created a marshal of France, upon the occasion of Napoleon's becoming emperor, in May 1804. Kellermann, after the Restoration, joined the Bourbons, and was created a peer of France, and honoured with the grand cross of St. Louis in August 1814. He died at Paris in 1820. (*Mil. Cycl.*)

KEMBLE, CHARLES, the younger and last surviving brother of a distinguished family of actors and actresses, was born in 1775, at Brecknock, South Wales, where his father, Roger Kemble, was then manager of the theatre. He was educated at the Roman Catholic college of Douay. In 1792 he obtained a situation in the Post-office; but so strong was his predilection for the stage, that he soon threw up his employment; and, after a few exhibitions at private theatres, made his first appearance at the Sheffield theatre, as Orlando in 'As You Like It.' In 1794 he obtained an engagement at Drury Lane, and in 1797, at the Haymarket. It appears that in his early career there was considerable awkwardness in his gait and manner; and that it required much effort and perseverance to arrive at that perfection of art, of which he was afterwards so complete a master.

With the single exception of Garrick, Charles Kemble played successfully, for a lengthened period, the widest range of character of any actor of the age. His Macduff, Aufidius, Cassio, Laertes, Alcibiades, Henry V., Antony, and Orestes, were true personifications of historic character, as represented by a majestic form, an impressive countenance, and a full-toned, commanding voice. But Kemble did not confine himself to mere acting. He engaged in dramatic authorship; and in 1800 adapted to the English stage the 'Deserteur' of Mercier, which was brought out at the Haymarket, under the title of the 'Point of Honour,' and still continues one of the sterling pieces of the English boards. He was also the author of several other adaptations, as 'The Wanderer,' and 'Kamschatka,' both from Kotzebue; 'Plot and Counterplot,' from the French of Dieulafoy; 'The Child of Chance,' 'The Brazen Bust;' &c.; but these pieces were only short-lived on the stage.

Charles Kemble was for a short period the manager of Covent Garden Theatre; and in 1840 he accepted the office of Examiner of Plays, having closed his career as an actor on the 10th of April of the same year. He died in 1854. He left one son and two daughters, Fanny and Adelaide. His son, Mr. JOHN MITCHELL KEMBLE, was the author of the 'Saxons in England,' and distinguished as one of the chief Anglo-Saxon scholars and historians of the age. For many years he was editor of the 'British and Foreign Quarterly Review,' and held the office of Examiner of Plays, under the Lord Chamberlain. He died in 1857.

KENT (vii. 702-16). According to the census of 1851, the entire population of the county was 615,766; of which 307,041 were males, and 308,725 females. Of houses, inhabited and uninhabited, there were 113,217. The area of the county was 1,041,479 acres, and 1627 square miles, with a population of 375 persons to each mile. The population of the principal places was as follows:—

Ash next Sandwich	2,096	Hythe mun.	2,857
Ashford	4,092	—— parl.	13,164
Aylesford	1,487	Lee	3,552
Bexley	4,490	Lenham	2,070
Brenchley	2,639	Lewisham	10,565
Bromley	4,127	Maidstone mun.	20,740
Canterbury mun. & par.	18,398	—— parl.	20,801
Charlton next Woolwich	4,818	Marden	2,296
Charlton near Dover	3,126	Margate	9,107
Chatham	28,424	Milton next Gravesend	9,927
Chislehurst	2,088	Milton next Sittingbourne	2,407
Cranbrook	4,020	Northfleet	5,033
Crayford	2,935	Plumstead	8,373
Dartford	5,763	Ramsgate	11,838
Deal	7,067	Rochester mun. and parl.	14,931
Deptford St. Paul	20,825	Sandwich	2,966
Deptford St. Nicholas	6,900	Sevenoaks	4,878
Dover	22,244	Sheerness	8,549
Eltham	2,437	Sittingbourne	2,897
Erith	2,231	Speldhurst	2,839
Faversham	4,595	Strood	3,067
Folkstone	6,726	St. Peter's	2,975
Frindsbury	2,202	St. Lawrence	3,015
Gillingham	7,952	Sydenham	4,501
Goudhurst	2,594	Tenterden	3,901
Gravesend	16,633	Tunbridge	4,539
Greenwich	35,028	Tunbridge Wells	10,587
Hadlow	2,395	Walmer	2,165
Hawkhurst	2,704	West Malling	2,021
Herne, with Herne Bay	3,094	Westerham	2,113
Hougham and Barracks	2,630	Whitstable	3,086
		Woolwich	32,307
		Wrotham	3,184
		Yalding	2,674

KER'ASINE (Gr. *κέρας* a horn), a mineral of a light yellowish-grey colour, and found in a crystallized rectangular four-sided prism. Its specific gravity is 6; and its constituents are oxide of lead, muriatic acid, and carbonic acid.

KERRY, IRELAND (vii. 723-7). According to the census of 1851, the population of the county was 238,239; the inhabited houses, 33,477; and the area, 1,186,126 acres, of which 400,000 are arable, 13,000 wood, and 700,000 uncultivated. The population of the principal parishes was as follows:—

Ardfert	3,191	Killarney	14,155
Cahirciveen	3,155	Listowel	8,994
Castle Island	6,570	Tarbert	1,634
Dingle	8,507	Tralee	16,271
Kenmare	7,495		

KERTCH, a seaport town of Russia, situated on the south-east of the Crimea, about eight miles west of Yenikale, and celebrated as the place

against which an Anglo-French expedition was sent, during the siege of Sebastopol, in 1854–5. The squadron sailed on the 24th of May, 1855. The place was garrisoned by Russians; but on the approach of the expedition they blew up the magazines, destroyed the stores, and hastily vacated the place. After this, the expedition captured Yenikale, and entered the sea of Azoff, when Arabat, Genitch, and other places were attacked, and immense supplies of stores, as well as numerous vessels laden with grain, were speedily destroyed. Kertch was once the residence of Mithridates, and is the site of the ancient Panticapæum, the seat of the Bosphorean kings.

KHAMSIN, the name of a hot south wind or blast, which begins to blow in Egypt soon after the vernal equinox. It continues at intervals for a period of about fifty days, as the term implies, and is somewhat similar in its destructive effects to the simoom, or sirocco, so prevalent in the desert regions of the east.

KIDD, DR. JOHN, Regius Professor of Medicine in the University of Oxford, and Librarian of the Radcliffe Library, was born in the parish of St. James, Westminster, in 1775, and graduated at Oxford, where in 1803 he was appointed Professor of Chemistry, and in 1822 became Regius Professor of Medicine. He was the author of various scientific works of standard repute; among others, 'The Outlines of Mineralogy,' 'A Geological Essay on the imperfect Evidence in Support of a Theory of the Earth, deducible either from its general Structure, or from the Changes produced on its Surface by the Operation of existing Causes;' 'On the Adaptation of External Nature to the Physical Condition of Man,' being one of the Bridgewater Treatises; 'Observations on Medical Reform,' &c. Dr. Kidd contributed largely by his writings to the various departments of science, and in him the university lost one of its most active and valuable members. He died in 1851.

KILDARE, Ireland (vii. 733). According to the census of 1851, the population of the county was 95,754; the inhabited houses, 15,866; and the area 418,436 acres, of which about 50,000 were contained in the bog of Allen. The population of the principal places was as follows:—

Athy	5110	Maynooth . t.	2201
Kildare . . .	2229	Naas	5433
Leixlip . . .	1698	—— . . . t.	3471

KILKENNY, Ireland (vii. 736–9). According to the census of 1851, the population of the county was 158,746; the inhabited houses, 23,435; and the area, 508,811 acres, of which about 21,000 are uncultivated, and 18,000 in woods. The population of the principal parishes was as follows:—

Ballyragget . .	1170	Graigue-na-Managh . . .	3,528
Callan . . .	6365		
Castlecomar .	8766	Kilkenny . .	19,973
Freshford . .	1721	Thomastown .	2,180

KIL'LENITE, a mineral of a green-brownish colour, so called from occurring in the granite veins of Killeny, near Dublin. It occurs both massive and crystallized; but the crystals are not perfect. Its specific gravity is 2·69; and its constituents, according to Dr. Thompson, are—silica 49·08; alumina, 30·60; potash, 6·72; oxide of iron, 2·27; water, 10·00.

KIL'OGRAMME, a French measure of weight of 1000 grammes, equal to about 2¼th lbs. avoirdupois; 100 kilogrammes being equal to 1·9686 cwt. To convert pounds avoirdupois into kilogrammes, or the reverse, divide or multiply by 2·20485.

KILOMETRE, the French itinerary measure, or mille, being the tenth part of the new league, containing 1000 metres, or 1093·6389 yards.

KINCARDINESHIRE, Scotland (vii. 741). According to the census of 1851, the population of the county was 34,598; and inhabited houses, 6636. The area was 394 square miles, or 352,250 acres, of which about 120,000 were productive. The population of the principal places was as follows:—

Bervie, or Inverbervie . pa.	1459	Laurencekirk pa.	2125
—— bor.	934	—— t.	1611
Johnshaven . .	1172	Stonehaven . .	3240

KING'S COUNTY, Ireland (vii. 745–8). According to the census of 1851, the population was 112,080; the inhabited houses, 18,887; and the area, 493,955 acres, of which about 330,000 are cultivated, 11,000 woodland, and 145,000 uncultivated. The population of the principal places was as follows:—

Banaghar . .	1846	Edenderry . .	1804
Birr, or Parsontown . pa.	9567	Portarlington .	2728
—— . t.	5540	Tullamore . .	6864

KING-WOOD, a beautiful violet-tinted wood of Brazil, imported into this country in trimmed logs, from two to seven inches in diameter. It is principally used in turning and cabinet work. (Simmonds' *Dict. of Trade Products.*)

KINROSS-SHIRE, Scotland (vii. 752). According to the census of 1851, the population of the county was 8924; the inhabited houses, 1662; and the area, 77 square miles, or 49,531 acres. The population of the county town, Kinross, was 2590; and of the parish, 3227. Milnathort contained a population of 1605.

KIRKCUDBRIGHTSHIRE, Scotland (vii. 754). According to the census of 1851, the population of the county was 43,121; and the inhabited houses, 7009. The area was 954 square miles, or 610,734 acres, of which nearly one-third is arable. The population of the principal places was as follows:—

Castle Douglas .	1992	Kirkcudbright mu.	2778
Gatehouse . .	1750	Maxwelltown .	3280
Kirkcudbright bor.	2687	New Galloway .	447

KIRTLE, in the feudal ages, a sort of coat of mail, or surcoat. Sometimes it was short; but that of the Knights of the Bath reached to the heels.

KISSINGEN, a town and watering-place in Bavaria, thirty miles N.N.E. of Wurtzburg, which has acquired some reputation for its saline chalybeate springs, from which many hundred

thousands of bottles are annually exported. In 1852 an Artesian well, of extraordinary character, was opened, which was first begun in 1832, and worked amidst great difficulties. It has been described by Dr. Granville, who states that the borings were carried on to the unprecedented depth of 2000 feet, and that the jet-d'eau now issuing forth is of the most magnificent description. 'The water,' says he, 'issues from the soil with a temperature of 66° Fahrenheit, at the rate of 100 cubic feet per minute. The propelling power is a subterranean atmosphere of carbonic acid gas, acting with a force of sixty ordinary atmospheres. The borings reach two saline springs, and then descended to a bed of solid rock salt at a depth of nearly 2000 feet. M. Knorr, the engineer employed upon the works, has adopted a skilful mode of drawing up this salt. In the first place he drove down a tube five inches in diameter, to a depth of 330 feet, simply to keep out land-springs from rising with the well-water. Within this he introduced another tube, three inches in diameter, to a depth of 1740 feet, where its lower end was immersed in a body of slightly-salt water. Within this again is a third tube, two inches in diameter, which descends to the depth of 1940 feet into the rock salt. The operations, then, are as follow: —The slightly-salt water is forced up from between the outer and middle tubes. It is then forced down, between the middle and inner tubes, to the rock salt; whence, after saturation, it is forced up again within the inner tube. The water is thus enriched with 27 per cent. of salt; and it is lastly evaporated, until beautifully-white salt is procured from it. The salt is estimated at six million pounds per annum.'

KITTO, REV. JOHN, D.D., the author of many learned works connected with Biblical literature, was born at Plymouth in 1804. His father was in very humble circumstances, and at the age of fourteen young Kitto was placed in the parish workhouse. He was not idle there, but applied himself, at every interval of leisure, to reading and study. In 1825, by the kindness of a gentleman in the neighbourhood, Mr. Grove, he was enabled to publish a small volume of Essays and Letters, which first brought him into favourable notice. But labouring under complete deafness, arising from a severe fall from the roof of a house, he had the greatest difficulty to contend with. In 1829, however, he was engaged to accompany his friend, Mr. Grove, on an extensive tour through the East of Europe and Asia, when he had the opportunity of visiting Petersburgh, Astrachan, the Calmuck Tartars, Armenia, Persia, Bagdad, and other celebrated countries in the East. Thus he was enabled to acquire that familiarity with the customs and scenery of the East, which was of signal service to him in that department of literature to which he afterwards devoted himself. In 1833 he returned to England, and gained some notice by a series of papers in the 'Penny Magazine,' under the title of 'The Deaf Traveller.' In 1836 he brought out his 'Pictorial Bible,' in three volumes, a second edition of which was published in 1847, in four volumes. His work on 'Palestine,' (1841), his 'Cyclopædia of Biblical Literature' (1843), and his 'Bible History of the Holy Land (1850), with many other publications of a similar character, did not fail to establish his reputation as a Biblico-theological writer. In 1848 he commenced a periodical work, entitled 'The Journal of Sacred Literature;' and in 1853 he carried on another publication, called 'Sunday Reading for Christian Families.' But these different undertakings do not appear to have been productive of much profit; for several years before his death he was exposed to pecuniary difficulties, which a pension of 100*l.* a-year from the civil list did not entirely alleviate. Suffering from declining health, he removed with his family, in 1854, to the Continent. But continuing to linger under a neuralgic affection, and being seized by a paralytic attack, he expired at Cannstatt, near Stutgard, in November of the same year.

KNEB'ELITE, a hard and brittle mineral, of greyish colour, and spotted with red, green, brown, and white. It occurs massive, with a glistering lustre; and its constituents are silica, protoxide of manganese, and protoxide of iron, nearly in equal proportions. It was so called in honour of Major Von Knebel.

KNIGHTS, MILITARY, an institution of military knights at Windsor, formerly called 'Poor Knights.' It is a provision for a limited number of old officers, chiefly veterans, and owes its origin to Edward III. It is composed of a governor and seventeen knights, who are allowed three rooms each in Windsor Palace, and 2*s.* per day (besides other allowances), for subsistence.

KNOT, a sea-faring term for a nautical mile of 2208 yards; there being sixty knots to a degree, and three to a league. The knot is used for ascertaining the speed of a ship's sailing by means of the line-knots, which are placed at fifty feet from each other. It is then calculated that 120 times fifty feet make a geographical mile; and that as many knots will run from the reel in one trial as the vessel sails miles in an hour.

KRASINSKI, COUNT VALERIAN, a distinguished and learned Polish emigrant, was a native of the ancient Polish province of White Russia. At an early age he was appointed chief of the department of the ministry of Public Instruction in the kingdom of Poland. On the breaking out of the Polish revolution, in 1830, the count was sent to England on a diplomatic mission; but the fortune of war turning against his countrymen, in 1831, he was deprived of all his estates, and became a penniless wanderer; yet, amidst all his misfortunes, he never ceased to assert the rights of his countrymen, and to direct his pen to the pursuits of literature. At the same time his high intellectual qualities, and elegance of manners, always rendered him a welcome guest among the most refined circles of London, and also of Edinburgh, where he resided for the five last years of his life. The principal of his works were of an historical or political nature, among which may be enumerated the following:—

'Historical Sketch of the Rise, Progress, and

Decline of the Reformation in Poland' (1839); 'Panslavism and Germanism' (1848); 'Sketch of the Religious History of the Slavonic Nations' (1849, 1851); 'Montenegro and the Slavonians of Turkey' (1853); 'Russia, Poland, and Europe' (1854); 'Poland—its History and Constitution, Literature, Manners, Customs,' &c. (1855). The Count died at Edinburgh in December 1855.

KREUTZER, a small copper coin of Germany, of different values in different States. In some places thirty kreutzers are equivalent to 1*s*. But in Frankfort, and the southern parts of Germany, three kreutzers are equal to 1*d*. sterling. In the canton of Berne, the coin passes for six deniers, and in Bale for five. The Austrian paper currency, marked zechn (ten) kreutzers, passes for twelve.

KROK'IDOLITE (Gr. *κρόκη* woof, and *λίθος* a stone), a mineral so called from its resembling asbestos, and having elastic fibres. It is massive and opaque, and of a light-blue colour. Its specific gravity is 3·2; and its constituents are silica, protoxide of iron, soda, magnesia, and lime.

KUGLER, FRANZ THEODOR, Professor of the History of Art in the Royal Academy of Berlin, and distinguished for numerous works on the history of Art, was born at Stettin in 1808. His principal work was his 'Handbook of the History of Painting, from the Age of Constantine to the present Time.' It has been translated into the principal languages of Europe. He died in 1858.

KUPFER SCHIEFER (Germ.), the copper slate of Thuringia, in which the remains of reptiles, especially Saurians, have been found. This is the earliest instance yet noticed of the occurrence of oviparous quadrupeds in the history of the earth's crust. These reptiles were first discovered in the time of Leibnitz, and have been classed by Cuvier among the living Monitors.

KURDISTAN (vii. 776). In 1846 Kurdistan was the scene of a fearful massacre of the Nestorian Christians by Bedr Khan, when many thousand persons were murdered, and sixty-seven towns and villages laid waste. Kurdistan had long been in a state of hostility with the Ottoman Porte; but the successful operations of 1847, which led to the capture of Bedarhan Bey, struck a decisive blow at the independence of Kurdistan, which has since fallen under the absolute authority of the Ottoman Porte. The population is about 1,000,000.

KY'ANITE, a mineral of a fine bright blue colour, and sometimes with a shade of green or grey. It is found both massive and crystallized, in six-sided prisms, with bases a little inclined.

KYANIZING (from *Kyan* the discoverer), the process of preserving timber from the dry rot by the application of corrosive sublimate, the perchloride of mercury. The timber is immersed in the solution, when the primary element of fermentation is neutralized, and the fibre of the wood rendered imperishable. But several other processes have been carried into successful operation since the first introduction of Kyan's process.

L.

LABIOBAR'BUS (Lat. *labium* a lip, and *barbus* bearded), a genus of fishes of the family *Salmonidæ*.

LABRADO'RITE, Labrador felspar, the constituents of which are silica, alumina, soda, and oxide of iron; specific gravity 2·7.

LAB'RIDÆ, a family of Acanthopterygious fishes.

LAB'YRINTH (Lat. *labyrinthus* a maze), a place formed of intricate or winding passages, which render it difficult to thread. In antiquity we have elaborate and interesting accounts of four celebrated labyrinths. The first was built by Dædalus in the Isle of Crete, to secure the Minotaur. [CANDIA, iv. 125.] The second was built by command of Psammeticus, king of Egypt, in the Isle of Meroë, near the town of crocodiles. The third was that of Lemnos; and the fourth that of Italy, which Porsenna, king of Hetruria, designed as his family sepulchre. Of these four labyrinths, although the Cretan is the most frequently mentioned by historians and poets, the Egyptian was by far the most important, both for magnificence and extent. According to Herodotus, 'it was not so much one single palace as a magnificent pile composed of twelve palaces, regularly disposed, which had a communication with each other. Fifteen hundred rooms, interspersed with terraces, were ranged round twelve halls, and discovered no outlet to such as went to see them.' There was the like number of buildings under ground, which, it is related, were intended for the preservation of the sacred crocodiles, and the burying-places of their kings. (Nuttall's *Class. Dict.*)

LABYRINTH'ODON. [CHEIROTHERIUM.]

LACH'ESIS, in zoology, a genus of venomous serpents, allied to the viper. In mythology, one of the Parcæ, or Fates, who presided over futurity, and was represented as spinning the thread of life.

LACH'RYMATORY (Lat. *lachryma* a tear), a small glass phial, or globular earthen vessel, with a long neck, frequently found in the ancient Roman sepulchres. In these vessels it is supposed the tears of the friends of the deceased were dropped, and preserved with the ashes contained in the funeral urn. They are often found

in our museums, and in the cabinets of the curious.

LADING, BILL OF (iii. 313). By stat. 18 and 19 Vict. c. 7, a material alteration was made in the law. Formerly the endorsement of bills of lading passed only the property in the goods. Now it transfers the liabilities of the original contractors and all the rights of suit.

LAFITTE, JACQUES, the celebrated French banker and financier, was born in 1798; and in the banking-house where he was first employed as a clerk he rose to be cashier and partner, and afterwards became the head of the most eminent bank in France. Having obtained this distinguished position, he was elected a member of the Chamber of Deputies. He strongly advocated liberal measures and liberal opinions, and eventually rendered himself so popular, that when Charles X. was driven from the throne, his influence, notwithstanding the general wish for a republic, was mainly instrumental in electing the citizen king, Louis-Philippe, to the throne. The revolution, however, was followed by so many commercial revulsions, which fell with overwhelming pressure on the house of Lafitte, that he was obliged to suspend payments. Yet so much sympathy was excited on his behalf, that a public subscription was entered into, and nearly a million and a-half of francs raised for his use. It appeared, however, that after the payment of all demands, he was in the clear possession of nearly 280,000*l*. He died, full of years and honours, in 1844.

LAMBERT, AYLMER BOURKE, a distinguished botanist, and for many years Vice-President of the Linnæan Society, was born in 1788. He was the author of many excellent articles contributed to the 'Linnæan Transactions;' and his own Herbarium was considered as one of the most complete in Europe. He died in 1842.

LAMELLIROSTRALS (Lat. *lamella* a thin plate, and *rostrum* a beak), a tribe of swimming birds, as the swan, goose, &c.

LAMENTATIONS, the name of the funeral music practised among the ancient Hebrews, whence, probably, the scriptural term, as applied to the Lamentations of Jeremiah. The *Lamentatrices* were the female vocal performers, who were hired to chant the lamentations over the dead, and to sing dirges of funerals, when they were accompanied with flutes. (Maimonides.)

LA'MIA, among the classical ancients, a kind of she-devil, or imaginary being, sometimes represented as a vampire, spectre, or other monstrous animal, which was supposed to devour children. Horace mentions them in his 'Art of Poetry.' Pliny represents the lamiæ as animals with the face and head of a woman and tail of a serpent.

In zoology, the *Lamia* is a genus of Coleopterous insects, and type of the family *Lamidæ*, forming a subdivision of the *Laminæ*, in which the sides of the thorax are either smooth or rounded, or tuberculate, rugous, or spiny.

LAMPROD'OMA (Gr. λαμπρὸς bright, and δόμος a house), a genus of Mollusca, of the family *Volutidæ*, and belonging to the *Olivinæ*, or Olives, in which the shell is mitriform.

LAMPS (Gr. λαμπτῆρες). In all ages lamps have been articles of important consideration, especially among the Egyptians, Jews, Greeks, and Romans, and have been generally executed with much taste and magnificence. A lamp, in its simplest form, may be defined as a vessel of metal or earthenware, containing oil or fat, and supplied with a lighted wick; but its different forms and constructions have been as varied as the purposes to which it has been applied. Its first invention is assigned to the Egyptians, and Herodotus describes a feast of lamps held annually in Egypt, which custom is celebrated even at this time, with great magnificence, among the Chinese. Lamps were very extensively used by the Jews in all their religious ceremonies and public festivals. The lamp, or candlestick, with seven branches, placed in the sanctuary by Moses, and those lamps prepared for the temple by Solomon, were of crystal, fixed upon branches, and filled with oil. Among the Greeks and Romans lamps were sometimes burnt in honour of the dead. In the early ages of Rome they were of a very simple construction, and made of terra-cotta or bronze; but in her more luxurious periods they were formed of Corinthian brass, silver, or gold, and arranged in stories, so as to produce a brilliant illumination. Among the discoveries of Roman remains no articles are more common than lamps, and they are found of all sizes and forms, and in every kind of material, of which a vast variety may be seen at the British Museum and in other antiquarian cabinets. Etruscan lamps are very rare; but those of Herculaneum and Pompeii, of a rich and elegant description, are abundant. In later ages we find the classical *bilychnis lucerna*, the *pharus*, and others, sometimes made of silver, and sometimes in the form of a crown or cross, with numerous branches.

In modern times the lamps have been as varied as the purposes for which they were intended. The old table and shop lamps of our forefathers emitted a brown and half-smoky light, owing to the absence of all scientific appliances. The Argand lamp, however, was a very ingenious contrivance, which, by means of a round and hollow wick, gave admission to a free current of air to the flame, and caused a clear combustion. [ARGAND LAMP, ii. 53.] A more extended knowledge of chemistry and mechanism has largely contributed to the improvement of modern lamps. The editor of 'Novelties and Inventions' has enumerated a great variety, many of which have now fallen into disuse, or been superseded by others of a superior description. Among others, he mentions the *Soho* lamp, which is adapted for burning fat or tallow, instead of oil; the *Carcel* lamp, invented by a Frenchman, in which the oil is raised through tubes by clockwork, so as to overflow at the bottom of the wick, and thus keep it saturated; the *Meteor* lamp, which burns rape-oil; the *Solar* lamp, that burns seal-oil, and in which three separate currents of air are brought to bear upon the flame; the *Camphine* lamp, of which there are various sorts, the fluid employed being camphine, which is distilled from common American turpentine; the *Benzole* lamp, the light of

which is produced by a hydro-carbon called benzole; the *Bude* light, whose excellence depends on the mode of admitting air to an ordinary oil or gas flame. But the lamp now most in use is the *Moderator*, which is very handsomely constructed, with ornamental pedestals, pillars, and glass globes. They are mostly of French manufacture, and sold at a very moderate price. They are constructed on a very ingenious principle. The oil is contained in a reservoir within the pillar of the lamp, and is pumped upwards when required; while the wick, which is inclosed within a circular and hollow tube, is raised or lowered by a little knob or screw. Yet these lamps are found to be expensive in the long run, owing to their liability to get out of repair, and the expense of the oil, which should be pure Colza, costing about 5*s*. per gallon; and the usual consumption being about half-a-gallon a week. 'In a recent number of the 'Mechanical Magazine,' it is stated that Young's Vesta lamp, well received some years back, has been presented to the public in a new edition, 'revised and corrected,' called the Bin-Oxydized Light, by which smell and showers of black snow are prevented. Young, of Manchester, has applied his paraffine oil to a lamp newly arranged. Pyrogenic oil, as manufactured by the Messrs. Holmes, is in their lamp converted into gas, and burnt without smell. It seems to be a lamp for the middle classes, and is perhaps the whitest light known. Little's 'Poor Man's Candle' is also a lamp constructed to burn paraffine oil.

The lamps employed in the lighthouses of our coast—so essential to the commercial interests of our country—have always been considered of vast importance; and many plans have been devised for their improvement. At first we had nothing more than large coal fires on the summits of open buildings. Afterwards the old-fashioned oil-lamps, with looking-glass reflectors, were introduced; next the Argand lamp with concave metallic reflectors; and then the convex lens, which was intended to focalize the rays of light by transmission. Various experiments at length led to more scientific principles and their practical application. Hence have arisen two systems, which are now generally employed in lamps used for lighthouses, viz. the *catoptric* and the *dioptric*, the one depending on the reflection of light from a mirror, and the other on its transmission of light through a lens. By these means the rays are concentrated, and become more vivid and intense. In the catoptric system, several concave reflectors, or mirrors, of extremely bright silvered copper, are placed at given angles round a central lamp, and so contrived as to reflect all their concentrated rays towards the sea. The dioptric system requires the use of powerful convex lenses, through which the rays of light are focalized in the required direction; but it is very difficult to make a lens sufficiently large for the purpose, and the expense is considerable.

LANARKSHIRE (vii. 811–13). According to the census of 1851, the population of the county was 530,169. Of inhabited houses there were 37,504. Area, 631,719 acres, or 987 square miles, more than one-third part of which is arable. The population of the principal places was as follows:—

Airdrie	14,435	Lanark mun.	5,304
Calderbank	2,872	—— parl.	5,008
Carluhe	2,845	Rutherglen mun.	6,947
Coatbridge	3,564	—— parl.	6,514
Glasgow mun.	148,116	Stonehouse	2,086
—— parl.	329,097	Strathhaven	4,274
Govan	3,131	Wishawton	3,373
Hamilton	9,630		

LANCASHIRE (vii. 813–24). During the present century the population and manufactures of this important county have been making rapid progress, to an extent almost unparalleled in the annals of human industry. [MANCHESTER, LIVERPOOL, &c.] In 1801, the population was 673,486; in 1811, 828,499; in 1821, 1,052,948; in 1831, 1,336,854; in 1841, 1,667,054; and according to the last census of 1851, the population of the entire county was 2,031,236; of which 991,090 were males, and 1,040,146 females. Of houses, inhabited and uninhabited, there were, in 1841, 321,823; and, in 1851, 367,368. The area of the county, in 1851, was estimated at 1,219,221 acres, or 1905 square miles, with 1064 persons to a square mile. The population of the principal places was as follows:—

Accrington	7,481	Denton	3,146
Aspull	3,278	Dunkinfield	12,132
Ashton mun.	30,676	Eccleston	3,115
——— parl.	29,791	——near Prescot	8,509
Ashton-in-Mack.	5,679	Farnworth	6,389
Astley	2,237	Fleetwood	3,121
Atherton	4,655	Garston	2,756
Barrowford	2,875	Gorton	4,476
Barton-upon-Irwell	12,687	Great Crosby	2,403
Bedford	5,384	Great Harwood	2,548
Blackburn	46,536	Habergham Eaves, part belonging to Burnley	12,336
Blackpool	2,180	Halliwell	3,959
Blackrod	2,509	Haslingden	6,154
Blatchingworth with Calderbrook	3,895	Haughton	3,042
Bolton	61,171	Heaton Norris	15,697
Bootle cum Linacre	4,106	Heap	15,848
Broughton	7,126	Hindley	5,285
Burnley	20,828	Hollingworth	2,347
Burscough	2,480	Ince in Makerfield	3,670
Bury	31,262	Kersley	4,236
Butterworth	5,786	Kirkham	2,777
Cartmel	5,213	Knott Lanes	6,044
Castleton	7,224	Lancaster	14,604
Chadderton	6,188	Lathom	3,291
Chorley	8,907	Latchford	2,542
Church Kirk	2,035	Layton with Warbeck	2,564
Clayton-le-Moor	3,292	Leigh	5,206
Clitheroe mun.	7,244	Leyland	3,617
——— parl.	11,480	Liverpool	375,955
Colne	6,644	Livesey	2,649
Crompton	6,375	Litherland	2,252
Dalton in Furness	4,683	Little Hulton	3,184
Darwen Over	7,020	Little Lever	3,511
Darwen Lower	3,521	Little Marsden	3,997

Lower Booths .	3,778	Standish, with Langtree. .	2,655
Lytham . . .	2,698	Stayley . . .	4,579
Manchester m.	303,382	Stretford . .	4,998
——— parl.	316,213	Sutton . . .	5,288
Middleton . .	5,740	Todmorden .	4,532
Mottram . .	3,199	Tintwistle . .	3,027
Much Woolton	3,616	Tonge, near Oldham . . .	3,831
Newton in Mackerfield .	3,719	Tottington . .	10,691
Newchurch in Rossendale .	16,915	Tottington Higher End.	2,958
North Meols .	8,694	Trawden . .	2,601
Oldham mun.	52,820	Turton . . .	4,158
——— parl.	72,357	Tyldesley . .	3,608
Openshaw . .	3,759	Ulverstone . .	6,433
Ormskirk . .	5,548	Upholland . .	3,359
Orrell . . .	2,762	Walmersley cum Shuttleworth . .	4,560
Oswaldtwistle .	7,654	Walton-le-dale.	6,855
Padiham . .	4,509	Walton-on-the-Hill . . .	2,469
Parr	4,875	Wardle . . .	2,244
Pemberton . .	5,252	Wardleworth .	14,103
Pendlebury .	2,750	Warrington m.	22,894
Pendleton near 'Salford . .	14,226	——— parl.	23,363
Pennington .	4,573	Wavertree . .	4,011
Pilkington . .	12,863	West Derby, part not in Liverpool .	10,971
Prescot . . .	7,393	West Thoughton . . .	4,547
Preston . . .	69,542	Widnes . . .	3,217
Radcliffe . .	5,022	Wigan . . .	31,941
Rainford . . .	2,333	Windle . . .	9,370
Rochdale pa.	29,195	Winwick . .	19,934
Royton . . .	6,974	Worsley . .	10,189
Rusholme . .	3,679	Wuerdle . .	5,611
St. Helen's . .	14,866		
Salford mun.	63,850		
——— parl.	85,108		
Sharples . .	3,904		
Spotland . . .	23,476		
Stalybridge .	20,760		

Since the census of 1851 the population, manufactures, railways, and wealth of the county have been fully as progressive as during the preceding decade from 1841. By the development and improvements in the machinery employed, during the year 1856, the consumption of cotton had amounted to 920,000,000 lbs. During the same year about 380,000 persons were employed in the cotton factories; and the value of property throughout the county had been enormously augmented.

LANCET ARCH, in architecture, an arch, the vertical point of which is like the head of a lancet. It is usually applied to long narrow windows, and is the oldest form of arch known in the East. The Gothic style passed from the East, through Italy and France, to England; and the lancet arch is its earliest feature. Bishop de Lucy first introduced the lancet arch, supported by clusters of slender columns, with capitals of foliage, into the Cathedral of Winchester, at the commencement of the 13th century.

LANDGRAVE (Germ. *land* earth, and *grave* a judge), a term applied to those princes of the German empire who possess by inheritance certain estates called Landgraviates.

LANDMARK, any mark to designate the boundary of land, or any elevated object that serves as a guide to navigation. Among the early Asiatics, Egyptians, and Jews, landmarks were in use for distinguishing the common divisions of lands; and the emphatic language used by Moses, 'cursed be he that removeth his neighbour's landmark,' is sufficient to show the importance in which these marks were held. Among the Romans they sometimes used boundaries or stones, where figures of the god Terminus were erected. In the Middle age crosses were usually placed to mark the boundaries of land, and sometimes to indicate the property of the soil.

LANDSEER, JOHN, Associate Engraver of the Royal Academy, was born at Lincoln, in 1761. His early instructor in the art, from which he has obtained so much celebrity, was Mr. W. Byrne, the well-known landscape engraver. In 1795 the name of Landseer first made its appearance on the title-page of twenty views in the south of Scotland, which were taken from drawings made by James Moore, Esq. In 1806 he delivered a series of lectures on the art of engraving, which he defined as 'a species of sculpture, performed by incision;' and proceeded to illustrate the subject with much ingenuity and learning. In the same year he was elected an Associate Engraver of the Royal Academy; and afterwards entered into some lengthened controversies with the Academy on the question of admitting engravers to the rank and title of Royal Academicians. In 1817, Mr. Landseer communicated to the Society of Antiquaries an interesting paper, entitled 'The Engraved Gems brought from Babylon to England by Abraham Lockett, Esq., considered with Reference to Scripture History.' In 1823 he published a more extended work on the same subject, under the title of 'Sabæan Researches,' comprising a series of lectures delivered to the Royal Institution on the engraved hieroglyphics of Chaldæa, Egypt, and Canaan. In 1834 Mr. Landseer presented to the world a lively and learned criticism 'on fifty of the earliest Pictures in the National Gallery.' It affords a variety of information, communicated in a very amusing form, and in a way which none but an artist, as well as a scholar, could have imparted. He died in 1852. Two of his sons, Charles and Sir Edwin Landseer, appear to have inherited their father's artistic genius; and are now members of the Royal Academy.

LANDWEHR (Germ. *land*, and *wehr* defence), the militia of Austria and Prussia. In Austria they are a kind of reserve to each regiment of the line, and drilled once a year under the same colonel. In Prussia the military consists of the youth of the kingdom, from twenty to twenty-five years of age; every subject being obliged to enter into the military service at that age. After two or three years' service, the soldier can proceed to his own home, but is liable to be called upon to join his regiment at every emergency. At the expiration of five years from the date of enlistment, the men are drafted into the first class or levy of the landwehr, remaining in it until their thirty-second year. In time of war they are

liable to be called upon to serve with the regiment of the *line* of a corresponding *number*; in fact they form the reserve of that regiment, whence reinforcements are drawn. From their thirty-second to their thirty-ninth year the men belong to the second levy, and are only called out occasionally in time of peace; but in war they garrison fortresses. (*Military Encyc.*).

LANGDALE, RIGHT HON. H. BICKERSTETH, LORD, Master of the Rolls, was born at Kirkby Lonsdale, Westmoreland, in 1783. His father was a country surgeon and apothecary. He was educated at the free-grammar school of his native place, and served his apprenticeship to his father. He afterwards entered himself of Caius College, Cambridge, where, in 1808, he graduated as senior wrangler. Having entered himself of the Inner Temple, he was called to the bar in 1811. In 1827 he became King's Counsel, and a Bencher of the Inner Temple, and filled the office of treasurer in 1836. Though of liberal politics, his talents were held in the highest estimation by all parties. In 1836 he was appointed to succeed Lord Cottenham as Master of the Rolls, and at the same time called to the House of Peers. He had thus risen, by an unusual exception, to one of the most honourable and important posts in his profession without having entered the House of Commons, or mingled in party politics. On the resignation of Lord Cottenham the great seal was more than once tendered to him; but which he did not hesitate to decline. He died in 1851.

LANGUAGES (vii. 834-9). The 'Military Spectator' offers some interesting speculations on the various languages in the world, which may be here given as illustrative of what is already written in p. 838. He says, on the authority of a learned linguist, whose great study, during his travels in every part of the world, has been the different languages spoken by man, that altogether there are 587 languages and general dialects in Europe, 937 in Asia, 226 in Africa, and 1264 in America, making a total of near 3000. He lays it down as a rule, that in all languages there is one great primary origin. Monosyllables are the primitive sounds, and syllabic compounds the result of interchange with other nations. Hence all the fundamental tongues are monosyllabic as to generic ideas, and compound as to species and varieties. According to his statements, the Chinese, Welsh, Greek, Hebrew, and German, are formed on this principle. The Chinese have 214 radical words and signs to represent these; out of which, by synthesis, other words are formed. He computes that there are 25,000 words in English, 20,000 in Spanish, 25,000 in Latin, 30,000 in French, 45,000 in Italian, 50,000 in Greek, and 80,000 in German.

In the life of Mezzofanti, the great Italian linguist, who is said to have understood seventy-two languages, it is stated that the list of those who have had a knowledge of more than ten languages is a very short one. Mithridates, Pico of Mirandola, Jonadab Alhanæ, and Sir William Jones, are stated to have passed the limit of twenty languages; the first two, twenty-two, and the last two, twenty-eight. Müller, Niebuhr, Fulgence, Fresnel, and perhaps Sir John Bowring, are usually set down as knowing twenty languages. For Elihu Burritt and Csoma de Körös their admirers claim eighteen. Renaudot, the controversialist, is said to have known seventeen; Professor Lee, sixteen; and the attainments of the older linguists, as Arias Montamus, Martin del Rio, the converted Rabbi Libettas Cominetas, and the Admirable Crichton, are said to have ranged from fifteen to ten or twelve.

LANTERN OF DEMOSTHENES. [CHORAGIC MONUMENT OF LYSICRATES, *Supplt.*]

LARCENY (vii. 849–51). According to an act passed in 1850 (13 & 14 Vict. c. 37), and amended 18 & 19 Vict. c. 126, entitled the 'Larceny Summary Jurisdiction Act,' all petty larcenies may now be tried and summarily determined by the magistrate, provided that the accused person assents to his jurisdiction, and pleads guilty to the charge; the punishment in such cases being limited to six months' imprisonment. This amendment in the criminal law was made with a view of preventing the delay, and saving the great expense of county prosecutions in petty cases of larceny.

LASWARREE, a town of Hindustan, in Delhi, which is celebrated in history as the scene where Lord Lake signally defeated the Mahrattas in November 1803; when the loss sustained by the British was 800 killed and wounded, and that of the enemy 7000.

LATHE (Sax. *leth*), a part or division of a county, containing three or four *hundreds*, or wapentakes, according to the laws of Edward the Confessor, as in the counties of Kent and Sussex. *Lathreve* was the name of an Anglo-Saxon officer, who had authority over the third part of the county, according to the number of lathes he governed.

LAT'ITAT (Lat. *lateo* to lie concealed), in law, the name of a writ calling upon a defendant to answer in personal actions in the Queen's Bench, under the presumption that he is lying hid in some other county.

LATITUDINA'RIAN, in theology, one who indulges in a latitude of thinking and interpretation in matters of orthodoxy.

LATRUN'CULI (Lat. *latrunculus* a little thief), a game among the ancient Romans somewhat similar to our game at chess, which so admirably represented the order and chances of war, that its invention has been attributed to some military officer of distinction. The latrunculi were the *latrones* and *calculi*, or chessmen of the game, made of glass or wax, and distinguished by black and white colours. In the Roman classics frequent allusions are made to this game; and a little poem was written upon it, addressed to Piso, which has been attributed to Ovid.

LAUDER, SIR THOMAS DICK, Bart., F.R.S., the versatile Scottish writer, and one of the first contributors to 'Blackwood's Magazine,' was born near Edinburgh in 1784. In early life he published two novels 'Lochindher,' and 'The Wolf of Badenoch;' which were soon followed by various other works, of a very popular character;

among others, 'The Floods of Moray in 1829;' 'Highland Rambles;' 'Tour round the Coasts of Scotland;' 'The Queen's Visit,' &c. Sir T. Lauder was deputy-lieutenant of the counties of Hoddington and Elgin. He died in 1848.

LAUDI, or LODI, in music, the Italian name given to certain spiritual or sacred songs, and composed in praise of God, or the Virgin Mary, or even the Saints. They were somewhat different from the common hymns. The name *Laudisti, or Laudesi,* was applied to the members of a society instituted at Florence during the 14th century for the performance of the Laudi. (Dr. Busby.)

LAU'RIDA, a genus of fishes of the family *Salmonidæ.*

LAVEN'DULIN (from *lavender*), a translucent mineral, of a vitreous greasy lustre; specific gravity 2·72; constituents, silica, alumina, lime, potash, and oxide of manganese.

LAW, CRIMINAL (vii. 873-80). Some material alterations have of late years taken place in the administration of our criminal laws; among others, is that of summary jurisdiction, which has been conferred on magistrates in petty sessions; and the power is also vested in a single magistrate of awarding punishment, on the confession of the crime by the prisoner. [LARCENY, *Supplt.*] Transportation, as a punishment, has been abolished by stat. 20 and 21 Vict. c. 3; and penal servitude substituted, except in long cases of imprisonment, when transportation may still be inflicted. Trustees have also been rendered liable to prosecution for breach of duty. In the general proceedings of criminal courts, some great improvements have likewise been effected. By stat. 14 and 15 Vict. c. 100, all technical objections for misnomers or non-descriptions are abolished; and the judges are vested with full powers of amendment.

LAW'MONITE, a crystallized mineral, of a vitreous lustre, sometimes white, and sometimes of a yellowish red. Its specific gravity is 2·3; and its constituents are silica, alumina, lime, and water.

AY (Anglo-Saxon *ley,* a song), in poetry and music a little pensive song or air, and generally used in that sense by Chaucer, Spenser, Milton, Waller, Dryden, and other classical English poets. The lay was originally formed on the model of the trochaic verses of the Greek and Latin tragedies; but, according to Dr. Busby, there were two kinds of lays; the *greater,* which consisted of twelve couplets of verses in different measures; and the *lesser,* which comprehended sixteen or twenty verses.

LAZZI (Germ. *lassig* lazy), among our Saxon ancestors, a term applied to the third and last class of the people, who were of a servile condition, and born to labour. They could not leave the soil, or quit their servitude, without the permission of the lord; but were in the position of serfs or slaves. The other two classes of society were the *Edhilingi,* or nobles; and the *Frilingi,* or gentry; the latter word signifying to be born free.

LEAD (vii. 893-8). The demand for and consumption of lead are continually increasing with the wants of society; and the supply is correspondent with the demand. Of the produce of Europe, fully two-thirds are derived from the mines of Great Britain. Spain produces about one-third as much; and the united production of these two countries is equal to seven-eighths of the European produce. A work, entitled 'Useful Metals and their Alloys,' informs us that the lead deposits of the United States 'extend upwards of 3000 square miles in the States of Missouri, Illinois, Wisconsin, Oregon, North Carolina, and California. A few years since, the Western States of North America produced large quantities of lead; as much as 40,000,000 of pounds were produced in 1851; but the deposits opened out, it is said, have not continued equally productive in depth, and their present comparative poverty is demonstrated by the large importations of British lead into these States.

LECTERNS, in the early Romish churches, the places where the epistle and gospel were sung, and certain services of the dead performed, sometimes formed in the shape of an eagle.

LECTISTER'NIA, among the Romans, the name of the tables, or pieces of furniture, on which were placed the statues of the gods invited to the feast called *Lectisternium.* Some of these lectisternia, made of bronze, and highly ornamented with figured work, have been found at Herculaneum. The feast at which these tables were used was a solemn ceremony observed by the Romans in times of public danger, when a magnificent entertainment, at which the Epulones presided, was served up in the temples; and the gods, whose images were placed on couches round the table, were invited to partake of the feast.

LECTURES, COPYRIGHT IN. According to 5 and 6 Wm. IV. c. 65, lecturers and authors are to have the sole right of publishing their lectures; and penalties are inflicted on those persons who infringe that right.

LEDGER-LINES, in music, those lines which are added above or beneath the five lines composing the stave. They consist of such notes as are too high or too low to be placed upon or within the regular stave. The invention of lines is generally attributed to Guido. When first introduced, the spaces between them were not used.

LEE, MRS. HARRIET, one of the authors of 'Canterbury Tales,' was the daughter of Mr. John Lee, a performer at Covent Garden Theatre. Soon after her father's death she commenced a school at Bath, in conjunction with her elder sister Sophia, which they jointly carried on for many years with considerable success. In the meantime they both devoted themselves to the production of works of fiction and the drama. Sophia was the author of 'Chapter of Accidents,' a comedy which was performed on the Haymarket boards, with tolerable success, in 1780; 'Almeyde,' a tragedy, in which Mrs. Siddons personated the heroine, in 1796; 'The Hermit's Tale,' a ballad (1787); and 'The Life of a Lover,' a novel in six volumes (1804). Her sister Harriet entered on the arena of literature a few years afterwards; and in 1786 produced 'The Error of

Innocence,' a novel; and the following year 'The New Peerage,' a comedy. In 1797–1805, appeared the 'Canterbury Tales,' of which Harriet was the principal author; the only contribution being the 'Young Lady's Tale and the Clergyman's,' by her sister. Mrs. Harriet's Tale of 'Kreutzner,' it is said, suggested to Lord Byron the tragedy of 'Werner.' The noble writer, in his preface, acknowledges that 'the germ of much he had written was discernible in that popular romance.' She was also the author of 'Clara Lennox,' a novel (1797); and 'The Mysterious Marriage,' a play (1798). She died at Clifton, in 1851, aged 94.

LEE, MRS. SARAH, formerly Mrs. Bowditch, known among naturalists as the biographer of Cuvier, was the only daughter of Mr. John E. Wallis of Colchester, and born in 1791. At the age of twenty-one she was married to Mr. T. E. Bowditch, the distinguished naturalist, whom she accompanied in a mission to Ashantee, and shared in all his labours and researches. The result was a variety of interesting works, the principal of which was the 'Mission from Cape Coast Castle to Ashantee,' published in 1819. In 1823 Mr. and Mrs. Bowditch again visited Africa,—the husband never to return; he died at Bathurst in January 1824. Shortly afterwards she brought out a 4to volume containing an account of their botanical and zoological researches and discoveries. On the occasion of her widowhood Mrs. Bowditch visited her old friend Baron Cuvier at Paris, by whom she was received as a daughter, and remained with him many years. After his death she published an interesting biographical memoir of the great naturalist, in which she was assisted by Baron Humboldt, Baron Pasquin, and other men of note. She had now married Mr. Lee, and the rest of her life was devoted to the composition of books of minor importance, which were very numerous; among others, 'Stories of Many Lands' (1835); 'The Juvenile Album' (1841); 'Elements of Natural History' (1844); 'The African Wanderers' (1847); 'The Farm and its Scenes' (1852); 'Playing at Settlers' (1855), &c. She died in 1856.

LEE, REV. DR. SAMUEL, Regius Professor of Hebrew in the University of Cambridge, was born at Longnor, co. Salop, in 1783, where he received the first rudiments of his education. At twelve years of age he was apprenticed to a carpenter and joiner. His father dying at an early age, he experienced the greatest hardships. In a communication made to Mr. Scott, of Shrewsbury, he has narrated the early difficulties with which he had to struggle. He there says that at the age of seventeen he formed the determination to learn the Latin language. Out of a small weekly pittance he contrived to obtain possession of Ruddiman's Latin Grammar, Corderius' 'Colloquia,' and Entick's Latin Dictionary. He was soon enabled to read the Latin Bible. Florus, Cæsar's Commentaries, Justin, Sallust, Virgil, Horace's Odes, and Cicero's Orations. He afterwards obtained a Greek Grammar and Testament, Schrevelius' Lexicon, and Huntingford's 'Greek Exercises;' and by plodding industry was enabled to master the more difficult Greek classics. In the same manner he acquired a knowledge of Hebrew, Chaldaic, Syriac, and Arabic. At the age of twenty-five he appears to have renounced the further study of languages, as they appeared, in his then humble situation of life, to be entirely useless. He had entered into a matrimonial engagement, and considered his trade as his only means of support. But a fire breaking out in a house he was repairing, all his tools were burnt, and he was thrown upon the world 'without a friend, a shilling, or even the means of subsistence.' While he was thinking of commencing as a country schoolmaster, but had not the means, the Rev. Archdeacon Corbett, who had heard of his attainments, sent for him, and benevolently promoted his interests in various ways. As Lee himself observes, 'It is to his goodness that I am indebted for the situation I at present fill, and several other very valuable benefits, which he thought proper generously to confer.'

Of Lee's studies in the Arabic, Persian, Hindoostanee, and other oriental languages, his kind friend, Mr. Scott, thus writes:—'In the course of a few months he was able not only to read and translate from any Arabic or Persian manuscript, but to compose in those languages. He has sent me translations into Arabic and Persian of several of Dr. Johnson's Oriental Apologues in the Rambler, and of Addison's Vision of Mirza in the Spectator; which were wonderfully well done.' In addition to his knowledge of the dead and Eastern languages, Mr. Lee also made considerable proficiency in French, German, and Italian.

For some years Mr. Lee was Master of Bowdler's Foundation School in Shrewsbury; which, in 1813, he left, on obtaining an engagement with the Church Missionary Society. In the same year he entered at Queen's College, Cambridge, when he rapidly acquired a knowledge of mathematics, and in 1817 took his degree of B.A. In 1819 he was elected Arabic Professor of the University of Cambridge, and, in 1831, Regius Professor of Hebrew, with the accompanying stall in the Bristol Cathedral. In 1833 the degree of D.D. was conferred upon him. His various publications, connected more especially with biblical and oriental literature, tend to show that his acquirements were profound and extensive, and his reading deep and varied. Among other valuable publications may be mentioned his Syriac Versions of the Old and New Testaments (1816); his Hebrew Grammar (1830); Travels of John Batula, translated from the Arabic (1833); the Book of Job, from the original Hebrew (1837); and a Hebrew, Chaldaic, and English Lexicon (1840). He also edited the Malay Scriptures and the Arabic and Coptic Psalter and Gospels, and translated the Book of Genesis into Persian. He likewise superintended the Hindoostance Prayer Book, and Morning and Evening Prayers in Persic; and was the author of several miscellaneous pamphlets, sermons, and contributions to the periodical literature of the day. He died in 1853.

LEGACY DUTIES (vii. 920). In January 1854 some important alterations took place in

the legacy duties, especially as regards the tax on freeholds, which were formerly exempt, but are now subject to the same duties as leasehold property. It appears that in 1854 the total amount of legacy duty paid in the United Kingdom was 1,526,170*l.* 8*s.* 4*d.*, being 1,321,915*l.* 13*s.* 5*d.* for England and Wales, 133,180*l.* 18*s.* 10*d.* for Scotland, and 71,073*l.* 16*s.* 1*d.* for Ireland. In the same year the probates, administrations, and testamentary inventories taken in the United Kingdom, yielded 1,176,911*l.* 10*s.*, divided thus: —England and Wales, 1,006,410*l.*; Scotland, 98,326*l.*; and Ireland, 72,175*l.* 10*s.* In 1855, the net produce of the duties in the United Kingdom amounted to 1,628,688*l.*; and in 1856 to 1,848,946*l.* In 1857 the legacy duties in the United Kingdom produced 1,641,578*l.* 15*s.* 11*d.* —viz. England and Wales, 1,434,527*l.* 8*s.* 3*d.*; Scotland produced 129,877*l.* 19*s.*; and Ireland, 77,173*l.* 8*s.* 8*d.*; while the probates, &c., brought 1,268,234*l.* 8*s.* to the revenue; 1,095,361*l.* 18*s.* from England and Wales; 88,931*l.* from Scotland; and 83,941*l.* 10*s.* from Ireland.

LEGAT'O (Ital. *tied*), in music, a term used in opposition to *staccato*, implying that one note is tied to another, and represented by placing these marks ⌒ ⌣ above or below the notes intended to be joined. Where these *legati* appear, the notes are to be played in a smooth and gliding manner, each note on the piano to be held down till the next is struck.

LEH'NUTITE, a mineral of a flesh-red colour, so called in honour of Capt. Lehnut; specific gravity 1·953; and its constituents, silica, alumina, soda, lime, and water.

LEICESTERSHIRE (vii. 930–34). According to the census of 1851, the population of the county was 230,308; of which 112,937 were males, and 117,371 females. Of houses, inhabited and uninhabited, there were 50,582. The area was 514,164 acres, or 803 square miles, with 287 persons to a square mile. The population of the principal places was as follows:—

Ashby-de-la-Zouch	3,762	Market Harborough	2,325
Castle Donington	2,729	Melton Mowbray	4,391
Earl Shilton	2,364	Mountsorrel	1,597
Hinckley	6,111	Sheepshed	3,759
Leicester	60,584	Whitwick	2,836
Loughborough	10,900	Wigston Magna	2,441
Lutterworth	2,446		

LEIPZIG (vii. 936–8). About 200 years ago, this city, now so celebrated for its book trade, did not contain more than five master printers and eleven compositors and apprentices. But such has been the wonderful increase of the publishing and printing trades, within the current century, that at present (1858) there are 116 publishers, and large bookselling houses, nine type-founders, and twenty printing offices, which employ 240 presses, 650 compositors and pressmen, and 200 apprentices. The annual consumption of paper averages 15,000 bales, at 5000 sheets each bale.

LEITRIM, county of, Ireland (vii. 939–41). According to the census of 1851, the population of the county was 111,915. Of inhabited houses, 18,931; the area, 650 square miles, or 392,363 acres, of which about 250,000 are cultivated, 116,000 mountain and bog, and nearly 24,000 water. The population of the principal places was as follows:—

Carrick-on-Shannon	pa. 1,796 t. 1,244	Manorhamilton	t. 1,230
Manorhamilton	1,799	Mohill	pa. 11,539 t. 1,217

LE-KEUX, the eminent architectural engraver, was born in London, in 1784. His father was a pewterer; but the son disliking the business, he was apprenticed as an engraver, at the age of seventeen, to Mr. Basire. He early distinguished himself for the bold and masterly specimens of Gothic architecture, which he laid before the world. In the general principles and details of that style he arrived at an excellence equalled by few in his profession; of which Britton's 'Cathedral and Architectural Antiquities,' Pugin's 'Architectural Antiquities of Normandy,' Neale's 'Westminster Abbey,' 'Memorials of Oxford and Cambridge,' and various other works of graphic art, afford many splendid examples. He died in 1846.

LEMU'RIA, among the Romans, a public festival instituted by Romulus, to pacify the manes of the dead; at which a variety of whimsical ceremonies were performed, for the purpose of keeping the assembled spirits at a respectful distance.

LEOCEPH'ALUS (Gr. *smooth-headed*), a genus of Saurian reptiles, of the family *Agamidæ*.

LEONHAR'DITE, a crystallized mineral, found in Bavaria, of a white or yellowish colour, and pearly lustre; specific gravity, 2·25; constituents, silica, alumina, lime, and water.

LEP'ADITES (Gr. λεπάς a limpet), the Goose Barnacles, of the family *Cirripedes*, of which *Lepas* (Barnacle) is one of the genera.

LEPER, a person affected with leprosy, a scaly cutaneous disease very general in the East. Lepers are frequently mentioned in the Old Testament. By the Jewish law they were excluded from all society, and driven into uninhabited places. Even kings, when afflicted with the disease, were shut out of their palaces, and deprived of their sovereign power. When a leper was cured he appeared at the city gate; but was not allowed to enter until examined by the priest, and had undergone certain ceremonies and ablutions. The disease is supposed to have originated from the poor living so much on fish, and wearing dirty under-garments. It seems to have disappeared, as it is supposed, with the use of tea, and the wearing of linen next the skin.

LEUCHTENBER'GITE, a crystallized mineral of a yellowish or white colour and pearly lustre; specific gravity, 2·974; constituents, silica, alumina, magnesia, peroxide of iron, lime, and water.

LEVIRATE, the name of that peculiar law among the Jews, which obliged the individual whose brother died without issue, to marry the widow, with a view of raising offspring to the family.

LEVITES, among the ancient Jews one of the priestly tribe of Levi, who were usually employed in the inferior offices of the temple, in which they were distinguished from the superior priests who were of the race of Levi, from the family of Aaron. The Levites applied themselves to the study of the law, sang, and played upon instruments in the temple. They were also the inferior judges of the country. They were divided into three classes; the first for preparing the offerings for sacrifice; the second, for the performance of the vocal and instrumental music; and the third, for taking charge of the gates of the temple, and preventing the entry of intruders in the sacred ground. For their subsistence they had the tithes of forty-eight cities allotted them, with fields, gardens, and pastures for their habitations.

LEVIT'ICUS, a canonical book of the Old Testament, being the third of the Pentateuch, written by Moses; and so called from its containing the regulations relative to the priests, Levites, and sacrifices.

LEYDEN JAR, a vessel employed in electrical experiments, so called from M. Vanleigh, of Leyden, the inventor. The preparation of this jar consists in a coating of tin-foil, inside and out, to within one-third of the top, in order that it may be readily charged and discharged by means of a metallic rod, which is in communication with the interior coating.

LIBELLAT'ICI, a name given to the apostates from Christianity, under the persecution of Decius, who were so called from the *libelli*, or certificates, which attested their compliance with the orders of the emperors, and protected them from molestation on account of their religion.

LIBEL'LI (Lat. *libellum* a little book), in the old civil law of the Romans, the name of the declaration or prosecutor's charge against the defendant; and in our spiritual courts it had also the same signification.

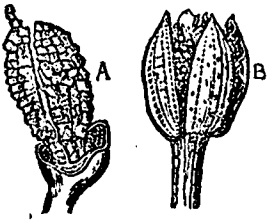
LI'BERI HOM'INES (Lat. *freemen*), in the feudal ages, a term in frequent use as applied to persons holding a military tenure, or to the freeholders of a manor. The ordinary freemen, as mentioned in Domesday, appear to have placed themselves by voluntary homage under the protection of great men, such as tenants in capite of the king. Their lord or patron undertook to secure their estates and persons; and for this protection they performed some annual service, or paid an annual stipend.

LIBERIA, a republican State of W. Africa, founded in 1823 by free blacks, from the United States of N. America. It extends along the coast of Guinea, between Sierra Leone and Cape Mensurado, a distance of 350 miles, with an average breadth of eighty. The population, in 1850, was 250,000; of whom 10,000 were free blacks from the United States, and the remainder aborigines, or captives released from being slaves. The country has been all purchased, from time to time, by the American Colonization Society; and it is estimated that two million inhabitants of the interior now obtain supplies of European goods from this republic and Cape Palmas. In 1848 the colony was recognised as an independent republic by Great Britain and France; and a treaty of trade and commerce has since that period been concluded between that State and Great Britain.

LIBRA, among the Romans, a pound weight, equivalent to the *as*, or twelve ounces. It was also the name of a coin consisting of twelve ounces of silver, or ninety-six drachmæ, worth about 3*l.* of our money.

LICHENS (vii. 978), an extensive family of plants belonging to the Linnæan class *Cryptogamia*; many of which possess important medical properties; yet hitherto they have not been studied with the care which has been bestowed upon many other vegetable productions. They are useful to man in two ways—first, by affording dyes; and, secondly, as food; the latter of which is found in the *Cetraria Islandica*, or Iceland moss (as already mentioned), *Cenomyce rangiferina*, or Rein-deer moss, *Sticta pulmonacea*, and *Alectoria usneoides*.

Lichens are directly opposed to Fungi, as they are perennial, and consist of a lobe and leaf-like thallus. They are usually found in those northern regions, where more delicately-formed plants cannot exist. The annexed is the representation of a lichen, called the *Jungermannia*, the fructification of which is here represented.



FRUCTIFICATION OF THE JUNGERMANNIA.

A is a very young spore-case, still covered by the calyptia; B, the same quite developed in the hyaline, ripe and bursting, and presenting to view the inclosed spores.

The *Promelia perforata* is a beautiful variety of lichen with projecting shields.

PROMELIA PERFORATA.

Dr. Lindley, in his 'Natural System of Plants,' places the *Lichenales* among the Asexual or Flowerless Plants (Class I. *Thallogens*), and describes them as 'Cellular flowerless plants, nourished through their whole surface by the medium in which they vegetate; living in air;

propagated by spores usually inclosed in asci; and always having green gonidia in their thallus.' He estimates the number of genera at 58; and the species at 2400. He also classifies the family under the Natural Orders, *Graphidaceæ*, or Letter-Lichens; the *Collemaceæ*, or Jelly-Lichens; and the *Parmellaceæ*, or Leaf-Lichens.

LIFE-BOATS. Notwithstanding the many ingenious plans for the construction of life-boats (vii. 995), the loss of life and property on the coasts of England continues to be seriously afflicting. In the severe gale of 1833, no less than sixty-one British vessels were lost on the east coast of England, and in the North Sea. In the storms of 1846, thirty-nine vessels were driven ashore in Hartlepool Bay; and in the course of the year 1850 there were 692 vessels wrecked, (with a loss of nearly 800 lives), all belonging to Great Britain. In September 1851 there were 153 vessels either stranded or sunk within our seas, or on our coasts. From January 1852 to May of the same year, the number of wrecks amounted to 300. Yet with all these melancholy losses, it appears that in 1852 there were only eight life-boats, which, according to Captain Washington, have been the means of saving eighty-three lives; but not one of these boats are on our dangerous west coast.

Owing to the many distressing catastrophes which have attended these life-boats, arising, perhaps, from their imperfect construction, the Duke of Northumberland, in 1850, offered a reward of 100 guineas to the contriver of the best life-boat; when nearly 300 persons became competitors. A committee was appointed to examine the plans and models; and those requirements which a life-boat ought to possess were clearly defined. The report of this committee contains the most useful mass of information ever collected; and it will always be looked upon as a valuable document in life-boat statistics. It was eventually decided that Mr. Beeching, of Yarmouth, had produced the most effective of all the life-boats, and the prize was accordingly awarded him. This boat was about 36 feet long, 3½ deep, and 9½ wide, with twelve oars, double banked. At a few inches below the gunwhale, a cork fender runs outside, which is about seven inches square. In all the vacant parts of the boat, air-cases are placed, for the purpose of giving extra buoyancy. Thus an upward tendency of more than eight tons is imparted, which counteracts the downward weight of the boat and crew. For ballast there are a number of divided water-tanks, with pipes capable of instantaneously emptying these tanks in case of need. In the event of upsetting, the thick iron keel, and the heavily-filled water-tanks near the bottom, in addition to the light-air cases above, quickly restore the boat's equilibrium. It is capable of carrying sixty or seventy passengers; and the draught of water, with thirty persons on board, is not more than two feet.

LIFE INSURANCES (vii. 997–1005). By the act of 7 and 8 Vict. c. 110 (September 1844), several new life-assurance companies were established. But according to the recent returns of the Registrar-General, it appears that out of fifty-four offices comprised in the list, thirty of them show an excess of expenditure over the premiums and interest received, and six of them an expenditure not only over the premiums and interest, but also over the capital paid-up, whereby all the receipts of the companies have been entirely absorbed, and they have been left in debt, either to general creditors or to capital, without the slightest accumulation having been made to meet their liabilities. Of the remaining twenty-four offices the expenditure of twenty-two has been barely within their receipts, and the accounts of the other two have been so unintelligible as to defy verification. After the exposure of this reckless system, thirteen offices have been compelled to dissolve, and forty have declined to make up any further returns.

The duties on policies of life insurance are rather onerous. The gross amount collected in 1856 by the various insurance offices was—England, 1,241,593*l.*; Scotland, 83,075*l.*; and Ireland, 62,538*l.* Total, 1,387,206*l.*

LIFE-PRESERVER, an ingenious apparatus, invented by Captain Manby, for rescuing persons from shipwreck. It consists of a long rope, attached to a shot, which is discharged from a mortar over the stranded vessel. A communication having been thus effected between the shore and the wreck, little difficulty remains in rescuing the passengers by the means of boats, or otherwise. Connected with this apparatus are night-balls, which are provided with hollow cases of thick pasteboard, with a fuze and quick match, and charged with sufficient powder to inflame them. The fuze is so graduated that the shell explodes at the height of 300 yards; and the balls spread a brilliant light for about a minute, and give a clear view of every surrounding object. This apparatus has been the means of preserving hundreds of lives, and much valuable property.

LIGHT-HORSE, cavalry lightly armed, and intended for active service and desultory warfare. Of this description are the light dragoons, mounted yeomanry, fencible cavalry, &c.

LIGHT INFANTRY, a company of young active men, who are always selected from the rest of the regiment, and occupy the left of the battalion, until called for separate service. The object of the light-infantry movements, whether in battalion or in company, is to protect the advance and retreat of the troops, and to cover and assist the manœuvres or formation of larger bodies. There are several light-infantry regiments in the British service distinguished for their gallantry in the field. (*Military Encyc.*)

LIGHTS, ARTIFICIAL (vii. 1017). [LAMPS, *Supplt.*]

LIMERICK, county of, Ireland (vii. 9–14). According to the census of 1851, the population of the county was 262,636; inhabited houses, 30,642; area, 678,224 acres, of which about 527,000 are cultivated, and 12,000 in woods. The population of the principal places was as follows:—

Askeaton	t.	1,957	Limerick	t.	53,448
———	pa.	3,920	Newcastle	t.	2,719
Ballingarry	pa.	6,327	———	pa.	5,560
Limerick	bor.	55,268	Rathkeale	pa.	7,723

LIM'ULUS (Lat. *limus* mud), a genus of *Entomostraca*, commonly known by the name of the King Crab. It is furnished with six pairs of prickly feet, and a long, sharp-pointed tail, sometimes sufficiently strong to be used by savages as a spear-head.

LINCOLNSHIRE (viii. 18–26). According to the census of 1851, the population of the county was 407,222; of which 205,083 were males, and 202,139 females. Of houses, inhabited and uninhabited, there were 84,785. The area was 1,776,738 acres, or 2,776 square miles, with 146 persons to each mile. The population of the principal parishes and towns was as follows:—

Alford . . .	2,262	Haxey . . .	2,129
Barrow-upon-Humber . .	2,283	Holbeach . .	2,245
Barton St. Mary	2,048	Horncastle . .	4,921
Boston . mun.	14,733	Kirton . . .	2,299
——— . parl.	17,518	Leake . . .	2,062
Bourn . . .	2,789	Lincoln . . .	17,536
Caistor . . .	2,166	Long Sutton .	6,591
Coningsby . .	2,098	Louth . . .	10,467
Crowland . .	2,466	Manthorp . .	2,344
Crowle . . .	2,245	Market Rasen .	2,110
Gainsborough .	7,506	Moulton . . .	2,058
Gedney . . .	2,519	New Sleaford .	3,729
Glandford Brigg	2,201	Pinchbeck . .	3,062
Gosberton . .	2,091	Shirbeck. . .	1,929
Grantham mun.	5,375	Spalding. . .	7,627
——— parl.	10,873	Spittlegate, Houghton, and Walton	3,084
Gt. Grimsby mu.	8,860	Stamford . .	8,933
——— parl.	12,263	Swineshead. .	2,044

LINE SYSTEM. [PRINTING.]

LINEN TRADE. This important branch of British industry has for years had to contend with a powerful rivalry in the increasing prosperity of the cotton trade. Notwithstanding it still continues to be a most important interest in our manufacturing economy, and its prosperity has for years been progressive. In 1800 the capital invested did not exceed 2,000,000*l.*, while at the present time (1859) it cannot be less than 15,000,000*l.*, giving employment to about 150,000 persons. Our export trade, in the face of many difficulties, has steadily increased from 2,992,143*l.* in 1835, to 4,096,986*l.* in 1845, and 5,057,507*l.* in 1855. Out of the exports for 1855 the United States took to the value of 1,884,113*l.* Though the trade was slightly checked during the continuance of the late Russian war, owing to the difficulties of obtaining from Russia the accustomed supplies of flax, yet since the conclusion of peace the goods exported have exceeded those of the two previous years by not less than twenty-five per cent. Notwithstanding the hostile tariffs of Belgium and France, British enterprise finds a market for its produce under the most unfavourable circumstances, and has succeeded in driving the fine linens and French cambrics entirely out of the English market.

LINGARD, REV. DR. JOHN, the Roman Catholic historian of England, was born at Winchester, in 1769, and educated at the University of Douay, in French Flanders. His first appearance as an author was in the year 1805, when he published a series of letters under the title of 'Catholic Loyalty Vindicated.' He was then a resident priest at Newcastle. He afterwards brought out a variety of works, at different times, of a controversial nature. In 1809 he published his 'Antiquities of the Anglo-Saxon Church,' which Southey declared to be full of Catholic sophistry and misrepresentation. His most important work, however, and that which forms the groundwork of his reputation, was 'The History of England, from the first Invasion of the Romans to the Year 1688.' It was printed first in 1819–25 in six vols. 4to; and secondly, in 1823–31, in fourteen vols. 8vo; and in 1849–50, in ten volumes. In this great work, the writer has been generally appreciated for his learning and industry, but condemned for the inveterate partiality he has everywhere exhibited for his profession and creed. Mr. (now Lord) Macaulay has spoken of him, in his Essays, as 'a very able and well-informed writer; but whose fundamental rule of judging seems to be, that the popular opinion on an historical question cannot possibly be correct.' The doctor was once offered a Cardinal's hat, and had an interview with the Pope on the subject, but he declined the offer, chiefly because it would 'put a stop to the progress of his history.' In fact a life of 'illustrious obscurity' was more consonant to his disposition and tastes. He died at Hornby, near Lancaster, where he had resided for forty years, in 1851, aged 82.

LIN'GULA (Lat. *lingua* a tongue), a genus of bivalvular Mollusca, which abounds in the fossil state.

LINLITHGOWSHIRE (viii. 30–31). According to the census of 1851, the population of the county was 30,135; and inhabited houses, 4059. The area was estimated at 101 square miles, or 64,375 acres, about three-fourths of which are arable. The population of the principal places was as follows:—

Bathgate . t.	3841	Linlithgow	bor. 4213
——— . pa.	4533	———	pa. 6115
Borrowstowness . . bor.	2645	Queensferry	bor. 1195
——— . pa.	5192	——— . t.	720

LINNÆ'A, a genus of plants of the order *Caprifolaceæ*, so called in honour of Linnæus. It is a pretty trailing shrub, and a native of the north of Europe.

LIP'ARIS (Gr. λιπαρὸς shining), the Sea-Snail, a genus of fishes of the family *Discobuli*. They resemble the gobies in form, and are generally found under stones at low-water mark.

LIST, DR. FREDERIC, an eminent political economist, and member of the Wirtemberg parliament, was born in 1789. His general opinions were of so bold and liberalizing a tendency, that he was at length expelled the Assembly; but in 1819 he established a journal, and published several spirited works on political economy, in support of his peculiar views and opinions. He at length succeeded in laying the foundation of the celebrated 'Zollverein' (the Customs' Union of the German States), which, after encountering various obstacles, was eventually adopted by

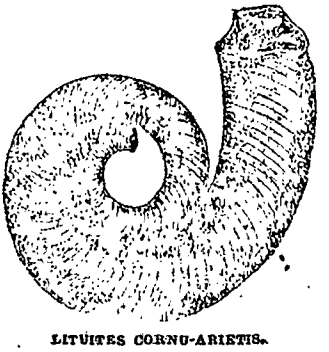
nearly the whole of Germany. But the doctor, having been long exposed to serious annoyances and disappointments, lost his mental faculties, and in a fit of insanity committed suicide in 1846.

LISTER, THOMAS HENRY, an historian and novelist, was born in 1801, and may be said to have descended from a literary ancestry; for both his father and grandfather, of whom Miss Seward has left some favourable notices, were well known in the republic of letters. Among Lister's lighter productions may be mentioned his 'Granby' and 'Herbert Lacy,' two 'fashionable' novels of considerable merit. But his 'Life and Administration of Lord Clarendon,' and his tragedy of 'Epicharis,' have contributed to establish his reputation as an historian and dramatist. He died in 1842.

LISTON, JOHN, a very clever and popular actor of farce and low comedy, was born in the parish of St. Anne's, Soho, and in very early life was engaged as a day-school teacher. But directing his attention to the stage, in 1805 he obtained an engagement at the Haymarket Theatre, where his peculiar drolleries and natural humour drew vast crowds of laughter-loving playgoers, and established his fame as a first-rate comedian. His acting, in the very clever comedy of 'Paul Pry,' which was one of his favourite characters, acquired him immense popularity, and has probably never been surpassed. On quitting the Haymarket he made his appearance on the boards of Covent Garden, where he remained, increasing in popularity, till 1823, when he received an engagement at Drury Lane, where he acted for some time. But in 1831, Madame Vestris, the then manager of the Olympic Theatre, offered him the enormous salary of 100*l.* per week, which he was induced to accept, and played on the boards of that theatre for six successive seasons. This may be said to have closed his theatrical life; but he was able to retire with a very comfortable independence. He died in 1846.

LITH'OMARGE, a mineral of a white, grey, or blue colour, occurring in massive or scaly glimmering particles; the constituents of which are silica, alumina, oxide of iron, chloride of sodium, and water.

LIT'UITES (Lat. *lituus* a curved trumpet), a group of fossil Cephalapods, found in the Silurian and other systems. The shell is partly convoluted, and partly straight.



LITUITES CORNU-ARIETIS.

Mr. Dallas calls these Lituites the representatives of the Nautilus and cuttle-fish, which, though not so plentiful as in former times, are still very common in certain localities.

LIVERPOOL, ROBERT BANKS JENKINSON, EARL OF, a distinguished statesman, and Premier of England, was born in 1770. He was educated at the Charterhouse; from which he proceeded to University College, Oxford. Under the ægis of his father, Charles Jenkinson, first Earl of Liverpool, he entered with every advantage on the political arena of his country at a most critical period of its history. In 1790 he was returned as member for Rye, and in 1796, having received the title of Lord Hawkesworth, on the creation of his father to the earldom, he was appointed a commissioner of affairs in India. In 1801 he became Secretary of State for foreign affairs; and four years afterwards was appointed head of the home department. In 1812 he was appointed prime minister. On the dissolution of the Addington administration, he resigned his position; but in 1817 he was re-appointed to the same office. On the death of his father, in 1818, he succeeded to the earldom. He died in 1828.

LOBO'TES (Gr. λοβός a lobe), a genus of fishes, of the family *Chætodonidæ*, in which the body is thick, broad, and ovate, and the pectoral and caudal fins rounded.

LOCKHART, JOHN GIBSON, D.C.L., was born at Cambusnethan, county Lanark, in 1794; and educated at Glasgow. Such was his early progress in scholastic studies, that in 1809, at the early age of 15, he was awarded the Snell exhibition to Balliol College, Oxford. He there graduated as B.C.L. in 1817; and in 1834 had the diploma of D.C.L. conferred upon him. After visiting the Continent he was called to the Scottish bar in 1816; but he never distinguished himself in forensic eloquence. In 1818 he became acquainted with Sir Walter Scott, who recommended him to the publishing firm of the Ballantynes, where he was employed to write the historical part of the Edinburgh Annual Register. Lockhart now became a most intimate friend of Professor Wilson, and his ablest co-adjutor in the conducting of Blackwood's Magazine. In 1820 he was married to Sophia, the eldest daughter of Sir Walter Scott, and lived for some time at Chiefswood, a cottage within an easy distance of Abbotsford. In 1820 he published his first novel, entitled 'Valerius, a Roman Story,' which was soon followed by 'Reginald Dalton,' and 'Adam Blair.' In 1825 his Life of Burns made its appearance in Constable's Miscellany of Cheap Literature; for which he also wrote a Life of Napoleon. In 1826, on the death of Mr. Gifford, Lockhart was appointed editor of the *Quarterly* Review, which he conducted with great learning and ability for a period of twenty-eight years.

On the death of Sir Walter Scott, in 1832, Lockhart was selected as his biographer; and he did not fail to execute his important trust with that ability for which his biographical powers had been so long distinguished.

In 1843 Sir Robert Peel appointed Mr. Lockhart to the office of Auditor of the Duchy of

Cornwall, at a salary of 600*l.* per annum; so that at this period of his life he must have been in rather opulent circumstances.

In 1853, Mr. Lockhart's declining health compelled him to resign the editorship of the Quarterly Review; and with broken spirits he visited Rome, but without any benefit to his enfeebled system. On his return to Scotland he was able to rally in some degree; but a violent attack of diarrhœa, in addition to an enfeebled constitution, speedily terminated his existence in November 1854.

LOCKS, and LOCK-PICKING. A lock may be defined as an instrument, composed of bolts and springs, for fastening or unfastening, by means of a key, a door, box, chest, or trunk. In contriving, varying, and adjusting the wards to which the key is to be fitted, a considerable degree of mechanical art and delicacy is required. From their varied structures, locks have received different names, as stock-locks, trunk-locks, padlocks, and spring-locks. The last of which, from their general use and curious structure, are of the most importance.

In 1851, the question of lock-picking was brought before the public, chiefly on account of Mr. Hobbs, an American smith, having succeeded in picking one of Bramah's locks, for which undertaking a large reward had been offered. The subject at the time occupied the attention of the Crystal-Palace Jury, who gave an interesting report thereon. In Bramah's lock there is a central tube or barrel, along which sixteen slides work up and down in grooves. 'Each slider,' says the Editor of Novelties and Inventions, 'has a slit or notch; and when all those notches coincide in position, or become parallel, a steel plate passes through them all, and unlocks the lock. This parallelism is precisely the *thing* which cannot be ensured without the use of a particular key. The notches are at different points in the length of the different sliders; and every slider requires to be pushed to a particular depth in its groove, in order that its notch may agree with those in the other slides. This is effected by using a key, the end of which has as many clefts as there are sliders, each cleft being deep enough to adjust the slider to its proper position.'

Next in importance to Bramah's lock may be noticed Chubb's Detector, in which there are six distinct tumblers working on a central pin, all requiring to be lifted by the key to various heights before the lock can be opened or shut; and in the event of the tumbler being overlifted by a pick-lock or false key, it is caught by a detecting spring, and notice is thus given of a furtive attempt having been made.

According to Mr. Hobbs, Newell's patent lock takes precedence of its contemporaries. He declares it to be proof against all attempts at picking. The key, which has several small projecting pieces of steel, removable by a wedge or pin, is in reality the regulator of the lock; and the interior mechanism can at any moment be changed to a new and more complex arrangement, simply by altering the bits of the key, which at once throws the movable parts of the lock into new and particular positions, and defies all attempts at lock-picking.

LOGANIA'CEÆ (from *Logania*, one of the genera, so called in honour of James Logan), in botany, an order of Dichlamydeous Exogens, consisting of herbs, shrubs, and trees, with opposite leaves entire, and generally stipulate. The order consists of 22 genera, and about 160 species.

LOGIER, JOHN BERNARD, author of the well-known Logerian system of musical instruments, and inventor of the key-bugle, was descended from a musical family, and born at Hesse-Cassel, in 1780. He received, at a very juvenile age, the first lessons on the piano-forte from his father, as well as a few rules on musical composition. His favourite instrument, however, was the flute; and in his tenth year he was able to play a double concerto in public. At the age of sixteen he was engaged as one of the band of the Marquis of Abercorn's newly-raised regiment, in the north of Ireland. He now devoted himself to giving lessons in music; and it was about this period that the new system of facilitating the acquirements of music presented itself to his mind. He first tried the experiment on his daughter, who laboured under an intractability of hand, which appeared to defy all his efforts; and this led him to the invention of the *chiroplast*. In a few months his daughter was able to perform the duty of organist at Westport Church, in the county of Mayo, and afterwards to play a sonata in public. A patent for the chiroplast was obtained in 1814; and while in Dublin he delivered two courses of lectures on harmony, which excited the attention of the musical world. He then undertook to instruct a few young children, who had never learnt before, and three months afterwards he submitted them to a public examination. The result was, that several of the professors in Dublin immediately adopted Logier's system; and in the following year it found its way into England and Scotland. Professors from various parts came to Dublin to be initiated; and academies were soon established in Glasgow, Manchester, Chester, Preston, and other places. In 1816 Mr. Webbe, of London, paid Logier a visit; and was so satisfied with his system, that he soon introduced it into the metropolis, and his academy was resorted to by the first nobility. In 1821 M. Logier received a proposal from the king of Prussia to instruct twenty professors, through whom the system was to be taught and diffused through the Prussian dominions. He gladly accepted the invitation, and engaged to remain for three years, with a handsome house and academy, and a liberal remuneration.

From the year 1817 to 1827, the Logierian system flourished; and among other adherents was one no less distinguished than Kalkbrenner, who, with Mrs. Webbe, joined the inventor in establishing his London academy. In the 'Dictionary of Musicians,' published in 1824, will be found a list of Logier's professional publications; and it is there stated, on the authority of Mr. Green of Soho Square, who had been the sole proprietor of the chiroplast, that up to that period nearly 1600 of that instrument had been sold, and more

than 50,000 of the elementary works, besides numerous translations; while at the same time about 100 professors had paid Logier 100 guineas each to be initiated into his system. (*Dict. of Musicians.*)

The death of M. Logier took place in 1846. But, as the editor of the 'Athenæum' observes, his system, for some years previous, had been 'rapidly sliding out of notice; and would now be hardly mentioned in the world of art, save for some event like that which has made us now rub up our recollections of the overture of Tancredi performed on sixteen pianos.'

LONDON (viii. 108–19). The boundaries and population of London since 1841 have been wonderfully on the increase. According to the census of 1851, the entire population was 2,362,236; of which 1,166,558 were males, and 1,255,678 females. That portion of London, forming part of the county of Middlesex, contained 1,745,601 inhabitants; of Surrey, 482,435; and of Kent, 134,200. Of houses, inhabited and uninhabited, there were 317,258. Area, 78,029 acres, or 122 square miles. The population of the parliamentary representation, consisting of eighteen members, was as follows:—

London City	127,869	IN SURREY.	
Finsbury	323,772	Lambeth	251,345
Marylebone	370,957	Southwark	172,863
Tower Hamlets	539,111	IN KENT.	
Westminster	241,611	Greenwich	105,784

In 1856, the number of parliamentary electors on the roll in Finsbury was 20,626, to a population of 323,101; in Greenwich the number was 7,888, to a population of 112,054; in Lambeth, 20,012, to a population of 272,189; in St. Marylebone, 20,851, to a population of 370,997; in Southwark, 10,170, to a population of 172,264; in the Tower Hamlets the number of electors was 27,980, the population being 541,119; in Westminster there were 13,182 electors to a population of 241,575. The number of houses rated to the relief of the poor in 1856 was as follows:—In Finsbury, 39,801; Greenwich, 20,306; Lambeth, 47,255; Marylebone, 43,883; Southwark, 25,644; the Tower Hamlets, 88,327; and in Westminster, 26,646.

The population of the principal parishes, in 1851, was thus enumerated:—

MIDDLESEX, PART OF.	
Kensington	44,053
Paddington	46,305
Hammersmith	17,760
Fulham	11,886
Chelsea	56,538
Hanover Square:	
St. George	73,230
Westminster:	
St. John the Evangelist	34,105
St. Margaret West	29,790
St. James West	36,406
Charing Cross:	
St. Martin-in-the-Fields	24,640
St. Marylebone	157,696
Hampstead:	
St. John	11,986
St. Pancras	166,956
Islington:	
St. Mary	95,329
Hackney:	
St. Mary, Stoke Newington	4,840
St. John	53,589
St. Giles:	
St George, Bloomsbury	16,870
St. Giles-in-the-Fields	37,407
Strand:	
St. Ann, Soho	17,335
St. Paul, Covent Garden	5,810
St. Mary-le-Strand	2,517
St. Clement Danes	15,662
The Rolls	2,567
Holborn:	
St. George-the-Martyr	8,763
St. Andrew	29,320
Saffron-Hill, Hatton Garden, Ely Rents, and Ely Place Liberties	8,728
St. Sepulchre	13,452
Clerkenwell:	
St. James	64,778
St. Luke's	54,055
East London:	
St. Botolph Without, Aldgate	11,325
St. Botolph Without, Bishopsgate	12,449
St. Giles Without, Cripplegate	14,361
St. Botolph Without, Aldersgate	6,221
West London:	
St. Bartholomew the Great	3,499
St. Dunstan West	2,887
St. Bride	6,039
LONDON CITY:	
Whitefriars	1,230
St. Anne Blackfriars	3,029
St. Gregory by St. Paul	1,428
St. Martin, Ludgate	1,246
Christchurch, Newgate-street	2,541
St. Dunstan-in-the-East	1,025
Allhallows Barking	2,001
St. Stephen, Coleman-street	3,036
Allhallows, London Wall	2,070
St. Andrew, Undershaft	1,181
St. Katharine Cree-Church	1,905
Shoreditch:	
St. Leonard's	109,257
Bethnal Green:	
St. Matthew	90,193
Whitechapel:	
St. Mary	37,848
Old Artillery Ground	1,972
Norton Folgate	1,774
Christchurch, Spitalfields	20,960
Mile-End-New-Town	10,188
East Smithfield	4,163
St. George's in the East:	
St. George	48,376
Stepney:	
St. John of Wapping	4,477
St. Paul, Shadwell	11,702
Ratcliff	15,212
St. Dunstan	80,218
St. Anne, Limehouse	22,782
Poplar:	
Bow	6,989
Bromley, St. Leonard	11,789
All Saints	28,384
SURREY, PART OF.	
Southwark:	
Christchurch	16,022
St. Saviour's	19,709
St. Olave	6,460
St. Thomas	1,555
St. John, Horsleydown	11,360
Bermondsey:	
St. Mary Magdalen	48,128
St. George, Southwark:	
St. George, the Martyr	51,824
Newington:	
St. Mary dis.	64,816
Lambeth:	
St. John, Waterloo	32,436
The Old Church	45,193
St. Mark	43,109
St. Matthew, Brixton	14,610
St. Luke, Norwood dis.	3,977
Wandsworth:	9,611
Clapham	16,290
Battersea	11,729
Putney	5,280
Tooting, or Lower Tooting	2,122
Streatham	6,901
Camberwell:	
St. Giles	54,667
Rotherhithe:	
St. Mary	17,805
Hatcham	4,074
KENT, PART OF.	
Greenwich	35,023
Deptford St. Paul	20,825
Deptford St. Nicholas	6,900

Woolwich . .	32,367	Plumstead .	8,373
Lewisham . .	10,565	Eltham . .	2,437
Charlton, next Woolwich .	4,818	Lee . . .	3,552
		Sydenham .	4,501

A return of the vital statistics of the metropolis, during the year 1856, was lately published by the Registrar-General, stating that in the fifty-two weeks ending the 27th of December of that year, 44,159 boys and 42,674 girls were born, and 28,894 males and 27,892 females died. It was computed that, with the addition of soldiers and sailors who have returned from the seat of war, the population, at the close of 1856, was 60,000 more than in 1855. At this time (1859) London is supposed to have a population of 2,700,000. Of the amount of traffic caused by this enormous population, some idea may be formed from a curious table published by Mr. Haywood, chief engineer to the City Board of Sewers. He states that in one day the number of vehicles passing by Cornhill amounted to 5256; by Temple Bar, 9883; Ludgate Hill, 10,626; London Bridge, 18,179. The average per hour of the whole traffic was 12,838; the maximum was 15,204 at twelve, noon, and the minimum 8454, at two A.M.

The food daily consumed by the vast population of the metropolis is almost beyond calculation. Of fish alone the consumption, of which official estimates have been made, is really astounding. The Billingsgate sales for one year amounted to 3000 millions, weighing altogether 230,000 tons, and worth two millions of money. Of soles there were 98 millions sold; of eels 10 millions; of lobsters a million and a quarter; of sprats 1780 tons; of herrings Yarmouth sometimes sends up 100 tons in a night.

As to the revenue and expenditure of the city of London, it appears, from statistical tables extending from 1847 to 1856 inclusive, that the receipts of the corporation amounted to 2,595,216*l.*; whereof 2,007,442*l.* is classed as ordinary, and 587,773*l.* as extraordinary receipts. It also appears that they have expended upwards of 915,000*l.* over and above their income; 550,000*l.* having been expended in the Cannon-street improvements; 450,000*l.* on the new cattle market, and 270,000*l.* in the Clerkenwell improvements; the entire returns of which do not now amount to more than 9000*l.* per year, including the ground-rents and tolls of old Smithfield market. The total ordinary receipts of the corporation for the year 1857 amounted to 205,298*l.*, the largest items being the coal duty (64,238*l.*); and the freehold and leasehold rents of city property (62,029*l.*); besides 21,540*l.* from rents of the Finsbury estate, 14,000*l.* from mortgage, 12,655*l.* from the Metropolitan Cattle Market, and 13,705*l.* from the other markets. The total amount of income-tax, collected in the city of London for the year 1857, was 403,211*l.* 15*s.* 4*d.*; land-tax, 50,859*l.* 17*s.* 2*d.*; and assessed taxes, 48,577*l.* 11*s.* 7*d.*—making together a grand total of 502,649*l.* 4*s.* 1*d.*

The improvements of a social and commercial character, within the last few years, have been correspondent with the ever-increasing wealth of this great metropolis. That magnificent pile of buildings—the new Houses of Parliament—may now be considered as completed; and the Victoria Tower, from its colossal appearance and architectural beauty, forms one of the most imposing objects of the metropolis. It is 325 feet high; the external width 70; and the internal diameter 51. The Crystal Palace at Sydenham, which originated from the great Exhibition of 1851, is another stupendous undertaking, that conduces materially to the social enjoyments, as well as the grandeur of the metropolis. [CRYSTAL PALACE, *Supplt.*] Battersea Park, and its beautiful suspension bridge, which is brought in connection with the new Crystal Palace railway, add greatly to the beauty of the locality, and materially contribute to the convenience and pleasures of the populous neighbourhoods on each side of the river. The quantity of land set apart for the park was 185 acres, of which 101 remain unsold. The whole outlay was 312,890*l.*; of which 246,517*l.* was paid for the purchase of land.

In order to meet the increasing requirements of commerce, vast additions have been lately made to the dock accommodations of the river Thames. The Victoria Dock, on the east side of Blackwall, is a magnificent undertaking, and is capable of affording accommodation to a great amount of shipping. The extensive works which have been carrying on for some time by the London Dock Company, for accommodating the largest vessels, have nearly arrived at completion. The works were designed, and the Act obtained in 1853, by Mr. Rendel, chief engineer of the company. The dimensions of the basin, when completed, will be 780 feet long, with an average width of 450 feet. The locks are each 350 feet long between the outer and inner gates, divided by a centre pair of gates into two locks, 200 and 150 feet long respectively. They are 60 feet wide, and will have 28 feet of water on the cills at Trinity high-water datum.

Not long ago an Act was passed for emptying all the great sewers of London into the river Thames, for the purpose of promoting the objects of the sanitary commission. But it has been discovered that the vast accumulation of sewerage in the river has at length converted it into a mere cess-pool, until the putrescent exhalations of this great arterial stream have become unendurable, and even threaten the health and lives of the inhabitants. Various commissions have been appointed to investigate the subject, and the results have been appalling. It was stated, before the Thames Committee, by Mr. Haywood, engineer to the city commission, that 'in the city of London alone there were 45½ miles of sewers large enough for men to enter. To these sewers there were about 2810 gullies of every description, and 1065 air shafts with ventilators, making 3875 openings to the sewers from the public ways. The total length of horizontal drain was 54,718 feet. The total number of inlets of all descriptions was 2696. Taking 16,300 as the number of houses within the city, the length of the house drains must be about 891,903 feet, or 168 miles. Again, taking the data furnished by the examina-

tion of 1000 houses, there must be 43,944 different inlets to the house drains; so that there would be within the city of London 48 miles of sewer, and 168 miles of house drain; and the number of air shafts, of gullies, and of inlets, would amount to a total of 47,819.' Various plans have been suggested to remedy the evils arising from this vast body of London sewage being emptied into the Thames; and at length an Act of Parliament was passed, in July 1858, for the formation of two vast sewers on the margin of the Thames, which should carry the filth of the metropolis to the mouth of the river. The execution of this great undertaking will take about five years, at an expense of three millions of money, to be levied as a rate upon the inhabitants of London; and the important question has arisen, whether the throwing away of the ammonia and phosphorus of the London sewage is not virtually throwing away the staff of life. A competent aurity has asserted that 'the proper outfall for the London sewage is not this or that point of the river, or of the sea, but a suitable tract of land growing exhausting crops. Fifty farms of 1000 acres each might be raised in value at least 10*l.* per acre per annum, by irrigation with the London sewage. This would produce 500,000*l.* per annum, equivalent, at 5 per cent., to 10,000,000*l.* of capital.'

The state of crime in this vast metropolis is rather appalling. According to the latest reports there were in London 143,000 vagrants admitted in one year into the casual wards of the workhouses. In 1856 it appears that 73,240 persons were taken into custody, of whom 45,941 were males, and 27,209 females; 18,000 of the apprehensions were on account of drunkenness, 8160 for unlawful possession of goods, 7021 for simple larceny, 6,763 for common assaults, 2914 for assaults on the police; 4303 women were taken into custody as prostitutes. The period of life most prolific of crime is that between the 20th and 25th years. The value of property stolen was 11,425*l.*; of property recovered, 3829*l.* The prison population at any particular time is 6000, costing for the year 170,000*l.* Our juvenile thieves cost us 300*l.* apiece. The average income of the London thief is estimated at 2*l.* per week.

LONDONDERRY, County of, Ireland (viii. 119-23). According to the census of 1851, the population of the county was 191,744; inhabited houses, 33,590; area 810 square miles, or 518,270 acres, of which about 320,000 are cultivated; 180,000 waste; and 10,000 water. The population of the principal places was as follows:—

Coleraine . .	6,165	Magherafelt t.	1,390
Dungiven . pa.	4,435	——— pa.	6,592
Kilrea . . pa.	3,437	Newtonlimavady. . pa.	3,614
Londonderry .	19,604		

LONDONDERRY, CHARLES WILLIAM STEWART, MARQUIS OF, was born in 1780, and received a commission in 108th Foot, at the age of fourteen. In 1796 he joined the expedition under the Earl of Moira, which was destined to relieve the Duke of York in Flanders. On the return of the British army he was attached to Colonel Charles Crawfurd's mission to the Austrian armies in 1795–7; and at the battle of Donauwert was severely wounded. On his return to England he passed rapidly through the different grades of military rank, until he was appointed to the lieutenant-colonelcy of the 18th Light Dragoons. He was soon afterwards engaged in the expedition to Holland under Sir R. Abercromby, and highly distinguished himself in the attack on the enemy's positions in September 1799. In 1803 he was made a colonel in the army, and soon afterwards assumed the command of a brigade of Hussars under Sir J. Moore, in Portugal. In 1809 Brigadier-General Stewart was appointed adjutant-general to the army under Sir Arthur Wellesley, in which capacity he highly distinguished himself during the pursuit across the Douro of the French army, under Marshal Soult. At Talavera the most honourable mention was made of his services. He also served with distinction, in 1812, at Busaco and Ciudad Rodrigo as adjutant-general. After the fall of the latter place the Marquis obtained leave to return to England. In 1820 he was nominated to the command of the 10th Hussars. In 1837 he obtained the rank of general in the army; and in 1843 he was removed to the command of the 2nd Life Guards. On the death of the Duke of Wellington, in 1853, he was created a Knight of the Garter. He died in 1854.

LONGEVITY, the length or continuance of life beyond its ordinary period of duration. It generally extends beyond seventy years of age, but does not in general much exceed eighty. Yet there are numerous instances of persons living to the age of 100 years or upwards, as the following list, given by an eminent actuary, will show.

1310	persons	from	100 to 110	years
277	„	„	110 to 120	„
84	„	„	120 to 130	„
26	„	„	130 to 140	„
7	„	„	140 to 150	„
3	„	„	150 to 160	„
2	„	„	160 to 170	„
3	„	„	170 to 185	„

In history, however, we read of some extraordinary cases of longevity; among others those of Thomas Carn, and Thomas Parr. The former was born in 1381, and died in 1588, at the age of 207, as recorded in the parish register of St. Leonard, Shoreditch. He thus lived from the time of Richard II. through twelve reigns. Thomas Parr was born in 1480, at Birmingham, co. Salop, and died at Westminster, in November, 1632, aged 152; having lived through ten reigns, from the time of Edward IV. to that of Charles I.

Longevity depends upon a variety of circumstances. Being born of healthy parents, and exempt from hereditary disease, are among the most favourable circumstances. But health and long life will depend much on the cheerfulness of disposition, on wholesome food, regularity of living, and, above all, on the manner in which the individual is employed. Those active occupations which are carried on in the open air, or in well-ventilated rooms, are the most conducive to a

healthy and protracted existence. These important considerations have not failed of late years to occupy public attention; and various measures, for promoting the sanitary condition and longevity of the people, have been carried into successful operation. At a late meeting of the Association for the Promotion of Social Science, held at Birmingham, the government actuary, Mr. Finlaison, exhibited tables, demonstrating that, in 1690, a person of thirty years of age could only calculate on living thirty years; while a century afterwards, in 1790, a person of the same age might reasonably expect to live thirty-five years; and this increase in the duration of life, which is still proceeding, is attributable to the progress of civilization—to better ventilation, drainage, and air, with improved food, shelter, warmth, and raiment. Of the influence and effects of various occupations on the duration of life, Dr. Letheby, in his very able 'Annual Review' of the health of London, gives the following interesting summary, as calculated from official returns: 'In comparative longevity,' says he, 'while the mean age of death in all London among adult males is a little less than 51 years, the merchant, shopkeeper, and domestic servant will live to be 57 years old; the butcher, poulterer, and fishmonger about 53; and most of the other classes from 50 to 52; though the painter, dyer, costermonger, hawker, bargeman, and waterman survive only from 48 to 49; the printer and compositor to but 45; and the baker and confectioner only to 42. Among females, the difference of occupation is not so striking, except in the cases of the wives of cabmen and publicans, who, instead of living to the mean age of 55, die at 49, and the poor needlewoman, who sinks into the grave at the average age of 40. The mean age at death of adult males in the city is 51, and of females 55. In all England it is 60 and 61.' Dr. Letheby also enters into some interesting statistical calculations on the rate of mortality per 1000 among different classes of the community. 'Thus,' he observes, 'butchers, poulterers, and fishmongers, shopkeepers and merchants, have died at the rate of only 15 to 16 in 1000, while tailors and weavers, shoemakers, printers, and compositors have succumbed at the rate of from 20 to 23 per 1000; wine-merchants, publicans, and waiters, porters and messengers, at the rate of from 24 to 26 per 1000; blacksmiths and gas-fitters, painters and glaziers, dyers, bargemen, and watermen, at from 28 to 30 in 1000; cabmen, draymen, ostlers, carmen, and stable-keepers at the rate of 31 per 1000; clerks and needlewomen at the rate of from 34 to 35 per 1000; and, lastly, the harder working classes of carpenters, masons, and labourers, at from 43 to 45 per 1000. So that very few of the members of these hard-working occupations can be said to arrive at that period of life usually designated longevity.'

LONGFORD, County of, Ireland (viii. 124–7). According to the census of 1851, the population of the county was 82,350; inhabited houses, 13,837; area, 412 square miles, or 263,645 acres, of which about 192,000 are cultivated; 58,000 waste; 5000 wood; and 13,675 under water. The population of the principal places was as follows:—

Ardagh	pa.	2694	Granard	pa.	8471
Ballymahon	pa.	1025	Longford	t.	5276
Granard	t.	1805	———	pa.	6387

LOPH'YRUS (Gr. λόφος a crest, and οὐρὰ a tail), a genus of Saurian reptiles, of the family *Agamidæ*, in which the head, body, and tail are surmounted by a spiny crest. The name also applies to a genus of Hymenopterous insects, of the family *Securifera*.

LOUIS-PHILIPPE, ex-king of the French, was born at Paris in 1773, and was the eldest son of Philippe Joseph, Duke of Orleans, the notorious Duc d'Egalité of the Revolution. He was carefully educated under Madame de Genlis, the eminent French writer. The title he bore in his youth was Duc de Chartres; and he was then distinguished by many traits of liberalism and manly courage. In 1791 he was put in command of the 14th Regiment of Dragoons; and war having been declared against Austria, in 1792, the duke entered upon his first campaign. He was actively engaged in the battles of Valmy and Jemappe, under Kellermann and Dumourier. During the violence of the revolution the duke's father was put to death, and a few months afterwards he himself, with General Dumourier, was summoned before the Committee of Public Safety; but knowing the sanguinary character of that tribunal, they both effected their escape into the Belgian Netherlands. He then retired into private life, honourably refusing to accept the Austrian offers to take up arms against his own country. He proceeded to Zurich; whence he was soon obliged to fly, and wander, with very inadequate means, through the different countries of Europe. At length, being only twenty years of age, he obtained the situation of teacher in the academy of Reichenau, a village in the south-east of Switzerland, where he passed under the name of Chaboud-Latour. In 1794, his retreat having been discovered, he was obliged to fly, when he travelled, chiefly on foot, through Norway, Sweden, Finland, and Denmark, under an assumed name. The French Directory having in vain endeavoured to discover the place of the young prince's retreat, at length entered into negotiations for permitting him to go to the United States, to which he departed in September 1796. In the following November he was joined by his two younger brothers at Philadelphia. They soon afterwards travelled through the western country; then proceeded to New Orleans, and subsequently to Havannah, and the Bahamah Islands. From the last place they embarked for New York, and thence sailed in a private vessel to England, where they arrived in February 1800, and took up their residence at Twickenham. Here their time was chiefly passed in study; and no event occurred worth noticing, until the death of his two brothers, the Duc de Montpensier, and the Comte de Beaujolars, in 1807 and 1808. After fifteen years' separation he met his sister, the Princess Adelaide; and they went together in quest of their mother, whom they found at Minorca. The three

then set sail for Sicily, where they had been invited by King Ferdinand. Here the duke contracted marriage with the daughter of the king, the Princess Amelia, in November 1809. No event of importance occurred, until the abdication of Napoleon, and the restoration of the Bourbon family to the throne of France, in 1814. The duke set sail immediately, and arrived at Paris on the 18th of May, when he was soon put in possession of the honours and estates to which he was entitled. On the return of Napoleon from Elba he was again obliged to quit France. But after the hundred days he revisited his native country, where he lived in comparative retirement, until the startling revolution of 1830 drove Charles X. from the country, and elevated the Duke of Orleans to the throne. The friendly feeling of England towards the new order of things was illustrated by the mutual visits of Queen Victoria and Louis-Philippe, in 1843; when the King of the French was invested with the Order of the Garter.

During a period of seventeen years Louis-Philippe sat peaceably on the throne of France, and contributed largely by his policy to the prosperity and greatness of the country. But at length he evinced a family sordidness, especially as regarded his son's matrimonial alliance with the Infanta of Spain, that disgusted not only France but all Europe; and in 1848 he was ignominiously driven from the throne by that very populace who had been the instruments of his previous elevation. He fled from Paris, and landed at Newhaven, in March 1848; when Claremont, the property of his son-in-law, the King of Belgium, was assigned him as a residence. Here he chiefly lived in retirement with his family until his death, which took place in August 1850. He was privately interred at the Roman Catholic chapel at Weybridge, in Surrey.

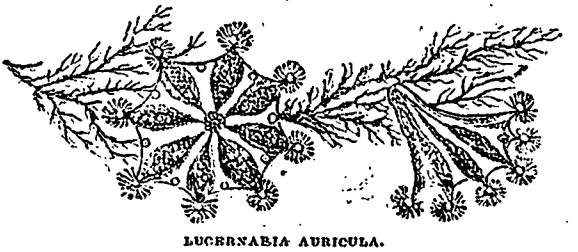
LOUTH, County of, in Ireland (viii. 154-6). According to the census of 1851, the population of the county was 107,657; inhabited houses, 16,487; area, 322 square miles, or 206,261 acres; of which about 15,500 acres are uncultivated, and upwards of 5000 in woods. The population of the principal places was as follows:—

Ardee . . . t.	2,752	Drogheda . .	16,845
—— . . pa.	5,944	Dundalk . . t.	9,842
Carlingford pa.	9,437	—— pa.	12,346

LOVE, FAMILY OF, a religious sect which flourished in Europe during the Middle age. Their doctrines were first promulgated in Holland by Nicholas of Leyden; and made their appearance in England about the year 1580. From its pretended sanctity the sect obtained a great number of followers among the lower orders; but Queen Elizabeth ordered their books to be burnt, and adopted measures for their suppression.

LUCAS, FREDERICK, many years editor of the 'Tablet,' was born at Croham, near Croydon, in Surrey, in 1812, and educated at the London University. In 1838 he was called to the bar, and the following year, although originally one of the Society of Friends, he became a member of the Roman Catholic Church. He soon afterwards established the Catholic newspaper, called the 'Tablet,' which in 1849 he transferred to Dublin. In 1852 he was elected M.P. for Meath, through the instrumentality of the Roman Catholic priesthood, of whom he was a zealous supporter, always advocating their right to interfere in political matters. But not being supported in these views by the Irish Episcopate, in 1854 he travelled to Rome, in order to appeal to the Pope against the decision of that body. But here his health broke down, and he was obliged to return to England, where he died in Oct. 1855.

LUCERNA'RIA (Lat. *lucerna* a lamp), a genus of Polype, of the family *Lucernaidæ*, and order *Carnosi*. They resemble Actinia; but are of a softer substance. They fix themselves by a slender peduncle to sea-weeds and other bodies. As Cuvier describes them, the upper part expands like a parasol, and is surrounded by numerous tentacula, arranged in bundles; and between these are eight cæca, proceeding from the stomach, and containing a red granulated matter. The species *L. quadricorna* has the edge in four forked branches with two bundles of tentacula in each. The other species *L. auricula* has the border octagonal, with a bundle of tentacula in each division. The annexed is a representation of the natural size.



LUCERNARIA AURICULA.

These Lucernària feed upon any minute animals that may happen to come within the reach of their tentacula, which, when searching for food, are stretched out to their full extent; but as soon as any unfortunate creature comes in contact with them, they seize and at once carry it to the mouth. 'Although, generally stationary (says Mr. Couch), these creatures are able to swim with considerable rapidity, by alternately contracting and dilating the body. In moving about to short distances, as from place to place on the plant to which they are attached, they adopt the same plan as the *Hydræ*, bending down their oral extremity until they can adhere by the tentacles, when the footstalk is loosened and thrown forward, and twirled about, till it meets with a

place to suit it. It is then fixed, and the tentacula are loosened, and in this way they move from one spot to another. Sometimes they move like the Actiniæ, by a gliding motion of the stalk.'

LUCERNI'NÆ (Lat. *lucerna* a lamp), a subfamily of the *Helicidæ*, or Testaceous Snails, with discoid shells, and the aperture generally toothed; of which *lucerna* is the type.

LUCIFER MATCHES (Lat. *luciferus* light-bearing), small slips of wood dipped in a composition of sulphur, phosphorus, and chlorate of potash, or nitre, which ignite by friction, or when smartly rubbed against any rough substance. They are sold in little boxes at a very cheap rate, and have become almost indispensable in domestic economy. The old tinder-box, the phosphorus bottle, the sulphurous match, and a variety of other chemical contrivances, have all given way to the simple congreve or lucifer match, the very perfection of utility and cheapness. Whether they ignite quietly like congreves, or noisily like lucifers, they all have the property of emitting instantaneous light simply by friction; and all have either phosphorus or chlorate of potash as one ingredient in the composition with which they are tipped. Humble and unimportant as these tiny bits of wood may appear, in a commercial point of view, yet their production affords extensive employment to many thousands. Amongst the number of match manufacturers in London, we are told of one single saw-mill that cuts up between four and five hundred large timber trees into splints for matches every year. In this process of cutting, many forms of machinery are brought into operation. In some the wood is first cut into quadrangular blocks, which are worked upon by a long range of sharp parallel knives; and these cutting knives work with such amazing velocity that from thirty to forty thousand splints can be cut up in a minute. These splints are then sold in wholesale masses, as large as hogsheads, to the different match makers of the metropolis and other large towns. These masses, however, as well as the little retail boxes themselves, are very liable to wholesale ignition, which is sometimes fraught with great danger. To obviate this, a new mode of preparing the combustible materials has been lately invented by M. Landstrom, of Sweden, who has a large manufactory at Jonkoping, where eight or nine millions of matches are produced daily. The peculiarity of these matches consists in the division of the combustible ingredients between the match and the friction-paper, instead of their being exclusively amalgamated in the composition forming the match. Thus the phosphorus (in the amorphous state) is placed on the sand-paper, while the sulphur, and a minimum amount of chlorate of potash, are combined with the match. By this arrangement neither match nor sand-paper individually takes fire from moderate friction. It is only when the phosphorized sand-paper and the sulphurized match come into contact with each other that ignition takes place. Thus accident from casual explosion can very rarely occur.

LUCKNOW, a large city of Hindustan, in the province and kingdom of Oude, of which it is the capital. It is situated on the Goomty, a tributary of the Ganges, and is about 170 miles N.W. of Benares. Population about 200,000. The streets are meanly built, narrow, and irregular; but there are some noble buildings; which, with their minarets, and gilded domes, present a gay and splendid appearance. The principal edifice is the Imam-barah, or Mausoleum of Asoph-ad-Dowlah, which was considered by Lord Valentia as the finest building he had seen in India. The place has acquired some celebrity from the gallant defence made by a handful of British soldiers in 1857 against the overwhelming forces of the rebellious sepoys during the late mutiny in India, when the heroic General Havelock, after repeated attempts, succeeded in entering the city, but was himself besieged, until relieved by the Commander-in-Chief, Sir Colin Campbell. Here General Havelock was attacked with cholera, which terminated his glorious career. [HINDUSTAN, *Supplt.*]

LUNACY (viii. 175–83). Many of the old statutes relative to lunacy have been extensively modified or altogether repealed; their administrative provisions having been consolidated and amended by the Lunacy Regulation Act of 1853 (16 and 17 Vict. c. 70). According to this statute, the Lord Chief Justices of the Court of Appeal in Chancery have the same jurisdiction as the Lord Chancellor; and by them all matters of lunacy are usually determined. As regards cases of lunacy in Scotland, the entire law has been consolidated and amended by a recent statute, 20 and 21 Vict. c. 71.

LUNATIC ASYLUMS (viii. 178–83). According to recent returns, the number of licensed houses for the reception of insane persons in England and Wales was 113. In those of the metropolis, the total number of private lunatics was 676 males and 630 females; and of pauper lunatics, 490 males, and 827 females; making a total of 2623. Most of these metropolitan asylums are agreeably situated in the suburbs, and have spacious gardens, lawns, and pleasure-grounds for the use of the patients. Sussex House, at Hammersmith, has no less than ten acres of lawn, garden, and meadow for the use of the inmates, and Brandenburgh House (the sister asylum) has two acres. The provincial licensed houses contained, of private lunatics, 754 males and 743 females; and of pauper lunatics, 603 males and 547 females—a total of 2647. The number confined in lunatic asylums, exclusive of licensed houses, was 16,154. A return has also been made as to the property possessed by individual lunatics, from which it appears that there were 127 lunatics who had cash less than 100*l.* per annum; 120 who had less than 200*l.*; 100 who had between 200*l.* and 400*l.*; fifty-eight who had between 400*l.* and 600*l.*; forty who had between 600*l.* and 1000*l.*; fifty-one who had more than 1000*l.*; and forty-six whose incomes had not been ascertained.

LU'PERCI, the priests of the god Pan, and the most ancient order of the Roman priesthood.

They were instituted in honour of Romulus and Remus, and so called from *lupus*, a wolf, because that animal was recorded to have suckled them. The place where the priests of Pan assembled was called *Luperca*, and his festivals took the name of *Lupercalia*. They continued till the year A.D. 496, when, on account of their licentiousness, they were abolished by Pope Gelasius.

LUSTRATION (Lat. *lustro* to purify), among the ancients a mode of purification by sacrifices and other religious ceremonies. Thus the Romans were accustomed to purify their cities, armies, fields, or people, after any impurity or crime. There was scarce any action performed, at the beginning and end of which some lustral ceremony was not required, to purify themselves, and appease the gods.

LYDIAN (from *Lydia*, a country of Asia Minor), an epithet applied by the Greeks to that music which was of a soft and flowing character,

> 'Softly sweet, in Lydian measure,
> Soon he soothed the soul to pleasure.'
>
> DRYDEN.

The character of this poetry is said to have been striking and animated, yet capable of pathos and melting softness; and it was on this account that Plato banished it from the republic. Some attribute its invention to Amphion; but Pindar states that it was first used at the marriage of Niobe.

LYNEDOCH, GENERAL LORD, was born in 1750, and was the third son of Thomas Graham of Balgowan, in Perthshire. By the death of his two elder brothers he succeeded to the family estates. But on the loss of his wife, to whom he was devotedly attached, he was induced to take up the profession of arms; and in 1793 he accompanied Lord Hood, as a volunteer, with British troops to Toulon. He afterwards raised two battalions; and in a very few months the first battalion, the 90th, formed a part of the Earl of Moira's army. Col. Graham was afterwards attached to the Austrian army of Italy, and was beleaguered in Mantua with General Wurmser during the investment of that city. As yet he had had but few opportunities of distinguishing himself; but in 1808 he was allowed to accompany his friend Sir John Moore to Sweden, and afterwards to Spain; where in 1809 the sanguinary battle of Corunna was fought, in which Col. Graham so distinguished himself, that he was immediately placed on the list of major-generals. He accompanied the British expedition to Walcheren and Flushing; but was compelled by the fever there prevalent to return to England. He was next ordered to Cadiz; and in 1811 a British force of 3000 men, commanded by him, and a body of 7000 Spaniards, were embarked in Cadiz Bay, in order to form a junction with the Spanish General St. Roche. The united forces, under General La Rena, took their positions near Barrossas, where a sanguinary battle was fought with the French troops, under Marshal Victor. Such was the consummate skill and promptitude of General Graham in his attack, that in less than one hour and a half from the commencement of the action, the enemy were in full retreat, with a loss, in killed, wounded, and prisoners, of 3000 men. In the summer of the same year General Graham joined the army under Lord Wellington, and took an energetic part in the siege of Ciudad Rodrigo. Owing to a complaint in his eyes at this period, he was obliged to return to England to seek advice; but early in 1813 he again quitted England for the Peninsula; and in June of the same year was engaged in the battle of Vittoria, at which he commanded the left wing of the army under the Marquis of Wellington, and not only defeated the enemy, but cut off their retreat by the highway to France. In the subsequent military affairs of the Peninsula, the name of Sir Thomas Graham was everywhere to be found, at San Sebastian, the Bidassoa, &c., until he succeeded in triumphantly entering on French ground. On his return to England he was appointed commander of the forces in Holland. After receiving the thanks of Parliament for his conduct in the Peninsula, he was raised to the peerage by the title of Baron Lynedoch, of Balgowan, co. Perth. In 1821 the governorship of Dumbarton Castle was conferred upon him. He died in 1844, aged 94.

LYONS, VICE-ADMIRAL LORD, was born at Barton, co. Hants, in 1790. He was educated at Westminster School; and in 1801 entered the royal navy. In 1804 he accompanied Admiral Duckworth's expedition to the Dardanelles; and proceeded to the East Indies in 1807. His various exploits stamped him as a true British sailor, and at the age of twenty he was appointed flag-lieutenant on board the *Minden* 74. While lying off the coast of Java he displayed consummate bravery by the capture of Fort Marrach; and in 1814 received post-rank. During the peace that followed he was employed in a variety of ways. In 1828 he commanded the *Blonde*, and entered the Black Sea, which was the first occasion on which a British man-of-war had ever done so. In 1835 he was knighted, and in 1840 made a baronet. His nomination, as second in command, of the Mediterranean fleet, in 1853, brought him from his embassy at Stockholm to commence that brilliant career which has rendered his name illustrious as a British seaman. In 1855, during the contest with Russia, he assumed the chief command of the Mediterranean fleet, on board the *Agamemnon*; when a series of victories, which are more matters of history than of biography, crowned his distinguished career. Kinburn fell, the fortress of Kertch was captured, and the attacks on the fortifications of Sebastopol were skilfully conducted. In 1856 he was created a British peer; and in 1857 he became vice-admiral of the White. He died at Arundel Castle, Sussex, the seat of his son-in-law, the Duke of Norfolk, in November 1858.

LYRODI (Gr. λύρη a lyre, and ᾠδή a song), among the ancient Greeks, the name of certain musicians, who played upon the lyre, and accompanied it with songs, either of their own composition, or the production of others.

M.

MACARONI.

MACARO'NI, a food product made of wheat flour, in the shape of pipes. Imports are received in small boxes from the Mediterranean, for consumption in puddings, soup, &c. *Vermicelli* is made of the same material, but in smaller rolls.

MACAW-PALM, a genus of palms, the *Acrocomia sclerocarpa*, of the West Indies. It comprehends a portion of those majestic species of palms which soar to the height of forty or fifty feet; and from their gigantic foliage and towering stems impart features of grandeur to the surrounding country. The fruit yields an oil of a golden yellow colour, of the consistence of butter, which has a sweetish taste, and emits an odour like violets. The nuts are sometimes fancifully carved by the natives, and highly polished.

M'CULLAGH, JAMES, F.R.S., Professor of Natural Philosophy in the University of Dublin, was born at Lough-lindhuhussey, co. Tyrone, in Ireland, in 1820. He was educated at the school of the Rev. J. Graham, at Lifford; and in 1824 entered Trinity College, Dublin, as a pensioner. Throughout his undergraduate course he gained every honour both in science and classics. In 1835 he was appointed Professor of Mathematics; and in 1843 was selected to fill the chair of Natural Philosophy. In 1830 he read his first paper on refracted light before the Irish Academy; and in 1838 received the Conyngham gold medal for a valuable paper 'On the Laws of Crystalline Reflexion and Refraction.' In 1842 he received the Copley medal of the Royal Society for his investigations on the theory of Light; and in 1843 he was elected a Fellow of that learned body. He died in 1848.

MACDIARMID, JOHN, proprietor and editor of the 'Dumfries Courier,' was born at Edinburgh in 1789. Here he was educated, and commenced his career as a mercantile clerk. He early devoted himself to literary pursuits, and occasionally acted as amanuensis and assistant to Professor Playfair. In 1817 he was appointed editor of the 'Dumfries Courier,' and afterwards became proprietor. It was in this position that he distinguished himself, and was the means of raising the character of the provincial press. But his literary talents were not confined to newspaper literature. He was the author of the 'History of Dumfries;' a 'Life of Cowper;' 'Life of Wm. Nicholson, the Galloway poet;' 'Sketches of Nature;' 'The Scrap Book,' &c. He died in 1852.

MACGILLIVRAY, WM., LL.D., Professor of Civil and Natural History in Marischal College, Aberdeen, was born in the Isle of Harris. Having in early life taken up his residence at Edinburgh, and devoted himself to the pursuit of natural history, he became assistant to Professor Jameson in the Natural History and Geological Museum of the Edinburgh University. He afterwards received the appointment of Curator of the College of Surgeons in Edinburgh. He pursued the study of natural history in all its branches with great ardour. After having been appointed to the professorship of natural history in Marischal College, Aberdeen, he produced several valuable works, which have largely contributed to the interests of science. In 1839 he brought out a 'Manual of Geology, with a Glossary and Index,' and afterwards a 'History of British Birds;' a 'History of British Quadrupeds;' a 'History of the Molluscous Animals of the Counties of Aberdeen, Kincardine, and Banff;' 'Conchologist's Text-book;' the last of which has been very successful. He died in 1852.

MACINTOSH CLOTH.

MACHINERY (viii. 222). It has been computed that there are 15,000 stationary engines in the kingdom, working in manufactories, mines, &c., valued at 25,000,000*l.*; besides 4000 wind, water, and steam mills, and 5000 horse and other small mills. In addition to this, we export machinery and mill-work to the value of 2,500,000*l.* (Simmonds' *Dict. of Trade Products.*)

MACHINES OF WAR. Among the ancients there was a great variety of destructive implements in use, which are frequently mentioned in the history of ancient warfare. Thus the Greeks had the Battering Ram; the Chelone, or Tortoise; the Scaling ladders (Climaces); the Helepolis, the Chroma, or Agger, which was raised higher than the wall; the Catapulta, from which they threw arrows; Purgi, towers of wood; and Lithoboli, from which stones were thrown with great velocity and force. Among the Romans, the principal machines of war were:—the Aries, or Ram; the Testudo, or Tortoise; the Ballista; the Catapulta; the Scorpion; the Belfragium; the Pluteus, &c. The Roman machines were adopted under various names in the Middle age. Besides the above, Grose enumerates the Mangona, the Trebuchet, the Petiary, the Matafunda, the War-wolf, &c., for throwing stones; the Bricolle, the Espringall, &c., for throwing darts; and the Cat for sieges. (Nuttall's *Class. Dict.*)

MACINTOSH CLOTH (so called from the inventor) is a singular but very useful manufacture, consisting of two layers of fine cotton, cemented with a solution of caoutchouc, in coal naphtha, or liquid India-rubber, and so completely conjoined as to appear one material. The cotton pieces, thus coated with the liquid, are passed between two smooth wooden rollers, and so thoroughly pressed as to be made to unite per-

manently and durably. Cloth thus prepared, when perfectly dried, may be cut and made into garments, which will bear the roughest wear, and be impervious to the most soaking rains. For travelling overcoats they are of great service.

MACROTRACH'IA, in conchology, a tribe of bivalve shells, which comprehends the families *Myadæ*, *Telluridæ*, and *Saxicavidæ*.

MADAGASCAR (viii. 229). On the death of King Radama, who was favourable to the spread of Christianity in his dominions, he was succeeded by his queen Ranavalona Manjaka, who adopted a contrary policy. She massacred all her husband's relations, and established a 'reign of terror' in Madagascar. From her accession dated the era of persecution against foreigners and Christians. In 1845 she decreed that her subjects should 'forget the name of Jesus Christ,' and issued an order that all foreign traders should become naturalized, and thereby become subject to a law, which, among other things, made them slaves under certain contingencies, and gave them a very short time to leave the island, if they did not choose to accept the alternative. In consequence an English and French squadron, on the queen refusing to negotiate, proceeded to bombard the forts, and the troops effected a landing; but they were compelled to retreat before overwhelming numbers. In August 1849, however, intelligence was received of the death of the queen. She was succeeded by her son, who, as a Christian, has since displayed a more enlightened and liberal policy.

MAGENDIE, FRANCOIS, the distinguished anatomist and physiologist, was the son of a physician at Paris, and born at Bordeaux in 1793. He was educated at Paris; and through the interest of his father became the pupil of the celebrated Boyer, and afterwards his demonstrator of anatomy. He was subsequently appointed physician to the Hôtel Dieu; and in 1831 he succeeded to the chair of anatomy in the College of France. He was one of the most skilful and experimental anatomists and discoverers of modern times; and his various experiments on living animals, to determine the functions and properties of the blood and nerves have placed him at the head of European physicians. His experiments on the absorption of poisons, such as strychnine, Prussic acid, &c., more clearly demonstrated the nature of their action on the animal system. So numerous, and apparently cruel, were his experiments, that the French authorities thought proper to interfere. He was the first to demonstrate successfully that the veins were organs of absorption, and indeed the great agents in the absorption of liquids. He was also a laborious writer; and, among other works, produced 'Elemens de Physiologie;' 'Leçons sur les Phénomènes physiques de la Vie;' 'Leçons sur les Fonctions et les Maladies du Système nerveux;' 'Leçons sur le Sang,' &c. He was also a contributor to various scientific Dictionaries and Encyclopædias,—as the 'Dictionnaire de Médécine usuelle;' 'Encyclopédie des Gens du Monde,' &c. He died in 1856.

MAGINN, DR. WILLIAM, one of our most versatile and energetic writers, was born at Cork in 1793. On his visiting London, in 1823, he obtained literary employment in a variety of ways as editor or contributor. He also wrote a romance, of a very striking character, entitled 'Whitehall,' which at the time excited much public attention. In 1828 he obtained an engagement as sub-editor on the 'Standard,' a daily evening paper, and his writings materially contributed to the popularity of that journal. To Fraser's as well as Blackwood's Magazine he was a regular contributor for some years, and his articles attracted considerable attention. It was in connection with Fraser's Magazine that he drew public attention to a severe and caustic review of a 'fashionable' novel, entitled 'Berkeley Castle,' written by one of the Berkeleys. The review was a complete lampoon on the family and their antecedents. This excited the ire of the writer, who, in company with a friend, committed a most outrageous assault on the proprietor of the journal, Mr. Fraser. This led to a duel between the writer and the doctor, who was determined to avenge the outrage committed on his friend. Although both the parties were slightly hit, the result was fortunately bloodless. With all his learning, wit, and eloquence, the Doctor was ever jovial and good-humoured; but like most men of versatile genius, he was occasionally prodigal in his habits, and reckless of expenditure, which often led him into pecuniary difficulties. He died in 1842.

MAGNE'SIUM (viii. 246). The opinion long entertained, that magnesium is volatile, has been confirmed by various experiments tending to prove that it melts and volatilizes at nearly the same temperature as zinc. The French chemists, Messrs. Deville and Caron, have thus described their preparation of magnesium. In a red-hot earthen crucible they introduce a mixture composed of 600 chloride of magnesium, 50 chloride of sodium (fused and pulverized), 50 chloride of potassium (ditto), 100 pure fluoride of calcium, and 100 small fragments of sodium. During the composition a hissing noise is observed, and when this ceases the lid of the crucible is removed, and the mixture stirred with an iron rod until it appears uniform, and the upper part of the liquid mass clear. The crucible is now taken from the fire, and when the saline contents are first on the point of solidifying, they are to be again stirred with an iron rod, which causes the suspended particles of metal to collect together. The mass is then poured out upon a plate of iron. When cool it is broken up, and the globules of magnesium picked out.

MAGOPHO'NIA (Gr. *Μάγων φόνος* slaughter of the Magi), the name of an important festival among the Persians, held in commemoration of the expulsion of the Magi, as mentioned by Herodotus, Strabo, and other ancient writers. It arose from the following circumstances. On the death of Cambyses, the throne of Persia had been usurped by one of the Magi, named Smerdis; when seven of the principal nobles conspired to overthrow him. They were successful; the usurper was killed, and the people rose and mas-

sacred all the Magi that could be found. Darius, son of Hystaspes, was then elected king. In commemoration of this event, the grand festival of the Magophonia was instituted, and celebrated for ages. On this day the Magi were not allowed to appear in public; and the people were at liberty to slay them wherever they were met with.

MAGYARS. [HUNGARY.]

MAHOG'ANY, a beautiful species of cabinet wood, so called from *Mahogani*, the American name of the tree, which is the *Cedrus Mahogani* of Miller, and the *Swietania Mahogani* of Candolle (xi. 731). It is a native chiefly of the Bay of Honduras, whence it is largely exported to this country. It is also exported from Cuba, Jamaica, Hispaniola, and South America generally. The tree is straight and tall in its growth. It is about four feet in diameter, and sometimes rises sixty feet from the spur to the limb. Its foliage is of a beautiful deep green; the flower of a reddish or saffron colour; and the fruit as large as a Turkey's egg. Some of these trees grow to a height of 100 feet. The wood is usually hard, takes a fine polish, and is much used in all kinds of cabinet work. The first appropriation of this valuable wood in England possesses some historical interest. At the latter end of the last century, an eminent physician, Dr. Gibbons, had a brother, a West-Indian captain, who brought over some planks of this wood as ballast. The doctor being then engaged in building a house in King Street, Covent Garden, his brother thought they might be of service to him; but the wood being found too hard for the carpenters' tools, it was laid aside as useless. Soon afterwards, Mrs. Gibbons wanting a candlebox, the doctor called on his cabinet-maker, Woollaston, in Long Acre, to make him one of some wood that lay in his garden. Woollaston also complained that it was too hard. The doctor said he must get stronger tools. The candle-box was made, and approved; insomuch that the doctor then insisted on having a bureau made of the same wood, which was accordingly done; when the fine colour and polish were so pleasing, that he invited all his friends to come and see it; among them the Duchess of Buckingham. Her grace begged some of the wood of Doctor Gibbons, and employed Woollaston to make her a bureau also, and this contributed to the fame of mahogany, which soon came into general use.

Our imports of mahogany average about 38,000 tons per annum.

MAI, CARDINAL ANGELO, chief librarian of the Vatican, and a member of many of the learned institutions of Europe, was born at Schilpario, in the diocese of Bergamo, in 1782. In 1812, having risen to some eminence in the literary world, especially for his critical knowledge in palæography, he was appointed keeper of the Ambrosian library at Milan. He soon distinguished himself in the walks of classical and antiquarian lore. In 1814 the first-fruits of his valuable discoveries from palimpsest manuscripts made their appearance. Among others came out the orations of Cicero on behalf of Scaurus, Tullius, and Flaccus, which had been found in the convent of Bobbio, but written over by a poet of the eighth century named Sedulius; likewise inedited fragments of three other orations, 'in Clodium et Curionem, de ære alieno Milonis, et de Rege Alexandrino.' A second edition of these works appeared in 1817. Abbate Mai now followed up his learned researches with great assiduity, and the results have been laid before the world. A few of his edited works, derived from the same source as the preceding, may here be mentioned:—the works of M. Cornelius Fronto; the orations of Q. Aurelius Symmachus; fragments of six comedies of Plautus, found written beneath a Latin translation of the Old Testament; 'Philo Judæus de Virtute et ejus Partibus' (1816); 'Porphyri Philosophi ad Marcellum;' 'Sibyllæ libri xiv., the Itinerarium Alexandri' (1817); a volume of Scholiasts of the fourth century upon Virgil, discovered under the works of Gregory the Great (1818); 'M. Tullii Ciceronis de Republicâ, quæ supersunt' (1822), considered as the most valuable discovery made by Mai; 'Scriptorum veterum nova Collectio, è Vaticanis codicibus edita' (1825). The whole of his labours were subsequently printed in two collections, one consisting of ten vols. 8vo, and embracing classical literature, and the other of ten vols. 4to, comprehending the early Christian writers. In 1837 our learned collector was created a Cardinal; and subsequently, on the death of Cardinal Lambouschini, he succeeded to the post of chief librarian of the Vatican. He died in 1854; but he had directed by his will that his vast library should be offered to the Pontifical government for half its estimated value (8000*l.*); and that the proceeds should be applied to the use of the poor in his native village of Schilpario. The Pope, however, succeeded in obtaining the library for 10,000 scudi, or about one-fourth the price originally proposed; and this valuable collection now occupies the Borgia rooms of the Vatican.

MAIRE (whence the Mayor of a corporation), among the ancient Franks the title of the supreme magistrate or political head of the State. He was usually elected by the nobles as a set-off against the absolute power of the sovereign; and at length became possessed of all the rights and prerogatives of royalty. Indeed neither rank nor dignity exempted a Frank from obedience to him. These Maires were actual ministers in peace, and independent generals in war. At length, after a long abuse of exorbitant power, they brought both constituents and masters into subjection. It is related, however, that Clotaire the Second, King of Western France, after his conquest of Burgundy, prevailed on the nobles of that kingdom, on the death of the Maire Varnacarius, to suppress that dignity in his favour. But under his successor, and irrevocably from the reign of his grandson Clovis the Second of France, the royal dignity and that of Maire of the palace became separate offices in the State, each possessing his distinct rights and prerogatives.

MAL'ACHITE (Gr. μαλάχη mountain green), the native-green carbonate of copper, which is found in a few localities of Siberia and South Australia. It is seldom met with in masses of more than ten or twenty pounds' weight; but in

Siberia there is a bed of malachite supposed to weigh half a million pounds, which lies embedded at a depth of 280 feet in a copper mine. When polished it has all the appearance of a bright and beautiful green marble, intersected and variegated with light-coloured veins. But so little was known of this mineral, before the Hyde Park Exhibition of 1851, that the public knew not whether the specimens there exhibited were stone or composition. Of late years, however, a Malachite manufactory has been established at St. Petersburgh, the material of which is chiefly derived from a mine in Siberia, belonging to MM. Demidoff; and their specimens of large doors, vases, and other articles are very beautiful. The fragments of Malachite are first sawn into thin plates, about the tenth of an inch in thickness. The artist has to determine what convolution or pattern the different green-tinted markings will present in the finished article, and he so selects the veneers, or small pieces, as to attain that object. When the pieces have been fixed with cement on some substance, as marble, copper, or iron, the small interstices are filled up with cement mixed with particles of Malachite, and coloured with a powder of the same material. After this the grinding and final polishing takes place. The process, however, is very tedious and expensive. The Malachite doors, which excited so much admiration at the Great Exhibition, employed thirty workmen for a whole year. Moreover, the cost of the raw material is very great. The average pieces brought up from the mine are valued at 15*s.* per lb.; and there is, besides, considerable waste in the working. All these circumstances materially add to the costliness of the articles produced.

MALAVILLY, a town of Hindustan, in the province of Mysore, rendered memorable by the victory obtained, in 1779, by General (afterwards Lord) Harris, over Sultan Tippoo's army.

MAM'ERTINE PRISONS, places of confinement at Rome, where State prisoners were incarcerated. They were built by Ancus Martius; and from what remains of them, more horrible dens could not be imagined. There were two of them, one above the other; and the only entrance was by means of a small aperture at the top of the upper prison, down which the prisoner was let. In the same way there was another small opening to the lower subterranean chamber, where humidity and eternal darkness prevailed, without any chance of escape. Jugurtha was among the number of State prisoners who occupied these dreary abodes. They were probably so called from the *Mamertini*, a mercenary band of rebellious soldiers who were defeated and almost annihilated by Hiero of Syracuse.

MAMIL'LA, a genus of Mollusca, of the family *Naticidæ*, in which the shell is heavy and oval, and the spire small and pointed.

MAMMOTH (Russ. *mamant* an animal of the earth) [viii. 292], the name of an extinct colossal species of elephant, nearly allied to the *Elephas Indicus* of Cuvier, but distinct from the Mastodon. The bones of this huge mammifer have been discovered in various parts of the world, and sometimes in a complete state. In the British Museum is to be seen an entire skeleton, with all the bones skilfully articulated; and in the Museum of St. Petersburgh is exhibited a perfect skeleton, the carcase of which was found preserved in ice in the north of Russia towards the end of the last century. In the Museum of Philadelphia is seen a colossal specimen which was found in 1801, at Newburgh, on the Hudson River, in the State of New York, about twelve feet below the surface of a morass. In 1817 the remains of a mammoth were discovered near the town of Goshen, Orange County, within sixty miles of New York. The length of the skeleton was computed at twenty feet; but following its curvature it measured, from the point of the tusks to the end of the tail, thirty-one feet; the length from the chin to the rump, fifteen feet; and the height over the shoulders, eleven feet. The entire skeleton weighed about 1000 lbs. The distinguished traveller and naturalist, Peter Simon Pallas, who was employed by Catharine of Russia to explore different parts of her empire, states that from the river Don to Tchutskoiness, there is scarcely a river that does not exhibit the remains of the mammoth, and that they are frequently embedded in alluvial soil containing marine remains. Entire carcases of the animal are seldom found; but isolated bones have frequently been discovered in different parts of the world, especially in Russia, Sweden, Siberia, Iceland, Poland, Germany, Hungary, Holland, and the north of the American continent, in Ireland and Scotland, and occasionally in the alluvial soils of England. Tusks, teeth, and bones of prodigious size have been found in the valleys of the Thames and the Medway; at Trenton, near Stafford; at Gloucester; in the county of Northampton; in Holderness, Salisbury Plain, Essex, and Norwich. They never occur in the regular strata, but in the super-imposing drift. Blumenbach, writing in 1803, states that within his knowledge above two hundred of these elephantine fossils had been found in Germany. It is, however, in the colder latitudes of Asiatic Russia that the mammoth, or fossil elephant, most extensively abounds; and there the ivory tusks are sometimes found in so perfect a state, as to be converted into articles of commerce, and used for ornamental purposes.

MAN (viii. 293–5). For the classification of the different Races of Mankind, see CAUCASIAN, MONGOLIAN, and NIGRITIAN, *Suppl.*

MANBY, CAPTAIN, F.R.S., &c., the inventor of apparatus for saving lives in cases of shipwreck, was born at Hilgay, in Norfolk, in 1765. He was educated at the Lynn Grammar School, and afterwards at the Royal Military College at Woolwich. On being disappointed of a suitable rank in active service, he accepted a commission in a militia regiment. He appears to have had an early ambition for authorship; and in 1801 he brought out 'The History and Antiquities of the Parish of St. David, South Wales.' In the following year he published 'Fugitive Sketches of the History and Natural Beauties of Clifton, the Hotwells, and Vicinity,' with other works of a similar character. In 1803 he was

appointed Barrack-master at Yarmouth, which produced him 450*l.* per annum. It was at this time that his attention was directed to the numerous shipwrecks on the eastern coast, and the melancholy loss of life often attending them. His first thought was how to throw a line to a stranded vessel; and it occurred to him that a piece of ordnance might be employed with advantage. For this purpose he succeeded in obtaining the use of a mortar from the Board of Ordnance. His first successful attempt was with the brig *Elizabeth* at Plymouth, which was stranded about 150 yards from the beach. He brought his apparatus into operation. A line was thrown over the ship; a boat was hauled off by it; and the crew, consisting of seven men, were brought safely to land. In the course of the following winter he succeeded in rescuing the crews of different wrecks from inevitable destruction. At length his services were brought before the House of Commons; and a Select Committee was appointed to investigate the subject. They reported so favourably that a grant of 2000*l.* was made to Manby out of the national exchequer. He was employed to report upon the dangerous parts of the eastern coast from Yarmouth to the Frith of Forth. In the course of two years his apparatus was ordered for fifty-nine stations, and associations for the preservation of life from shipwreck were established throughout the kingdom. In 1823 the House of Commons made a second grant to mark their approbation of Captain Manby's exertions. But the gallant veteran did not confine his operations to merely projecting the line over the stranded vessel. He devised an apparatus for throwing up balls filled with stars to explode at a certain height from the ground, for the purpose of obtaining a momentary view of a vessel on a dark stormy night. Amidst his philanthropic labours he still devoted himself to literature. He was the author of the 'Journal of a Voyage to Greenland in the Year 1821;' of an Essay on saving persons from drowning at the breaking of the Ice; an Essay on the extinction of destructive Fires; and also of various publications connected with his different philanthropic inventions. He died at Southtown, near Great Yarmouth, in 1854.

MANCHESTER (viii. 301). According to the census of 1851, the population of this important city, including Salford, &c., was 452,158, and the inhabited houses 53,697. The area of the parish, including the borough of Salford, was computed at 33,553 acres. As a proof of the rapid growth of this great hive of manufacturing industry, we have only to mention that in 1801 the population was barely 110,000. The causes of this prosperity are obvious. The proximity of an abundance of coals, the improvements introduced into spinning and weaving machinery by Hughes, Arkwright, Hargreaves, and Crompton, and the extensive application of steam-power, have enabled Manchester to produce two-thirds of the cotton manufacture of Great Britain. In 1853 it was estimated that there were in Manchester and Salford 265 great works, employing 41,464 persons with 8135 steam power, thus enumerated:—thirty-five works engaged in cotting-spinning with 5292 persons employed; sixty-five in cotton weaving, with 7709 persons;—forty-two, in cotton spinning and weaving, with 17,358 persons;—three, in woollen and worsted spinning and weaving, with 280 persons;—fifty, in silk-throwing and small ware, with 7520 persons;—thirty-five, in flax spinning, with 1120 persons;—and thirty-five print works, with 2185 persons; besides many bleaching and chemical works. The annual exports were valued at 12,000,000*l.* The railway communications are chiefly with Birmingham and London by the Grand Junction or North-Western Railway; besides constant railway traffic with those great commercial marts, Liverpool, Sheffield, Bolton, Preston, Rochdale, Blackburn, &c.

According to the statistical returns of September 1857, the number of buildings in Manchester were thus classified:—cotton-mills, 94; silk-mills, 11; worsted mills, 2; small-ware mills, 14; print-works, 5; dye-works, 33; hat manufactories, 11; machinists' premises, 62; foundries, 52; lead-works, 4; paperworks, 4; saw-mills, 52; corn-mills, 13; miscellaneous workshops, in various trades and manufactories, 1213; warehouses, 1753; dwelling-houses, 56,942; shops used as dwelling-houses, 6615; shops not used as dwelling-houses, 777; places of worship, 130; public and private schools, 283; barrack, 1; banks, 11; markets, 11; theatres, 2; railway stations, 8; gas stations, 3; workhouses, 2; infirmary, fever hospitals, dispensaries, 6; night asylums, 2; lock hospital, 1; penitentiary, 1; public institutions, 13; public buildings, 35; baths and washhouses, 9; breweries and distilleries, 193; slaughter-houses, 144; buildings used as offices, 598; livery-stables, 59; miscellaneous buildings, such as sheds, &c., not used as workshops, 2080.

In 1857 there was a grand Exhibition of Art Treasures in Manchester, which perhaps was the finest and most valuable collection in the world. So attractive was it considered that during the short period of opening, the number of visitors, from every part of the United Kingdom, was estimated at 1,335,000.

The new bishopric of Manchester comprehends the deaneries of Amounderness, Blackburn, Manchester, and Leyland. The bishop is under the metropolitan jurisdiction of the Archbishop of York; and he is endowed with an average annual income of 4200*l.* In February 1848 the Rev. Dr. Lee was installed as the first bishop.

MAN'GANITE, a mineral of a greyish-black colour, which occurs crystallized or massive, with a metallic lustre. It is the hydrated sesquioxide of manganese; and its constituents are manganese, 62·93; oxygen, 20·97; water, 10·10; specific gravity, 4·328.

MANIN, M., ex-President of the Venetian republic, was born at Venice in 1804. He received his education at the University of Padua, and obtained the degree of doctor at the age of seventeen. In 1830 he became an advocate at Venice, and soon attained a high reputation, which brought him into intimate contact with all the eminent men in Venice belonging to the

liberal party. In 1848 he played a prominent part in the political events of his country. He had been imprisoned previously to the outbreak of that year, but was liberated by the triumph of the popular cause. He then became Dictator, and President of the Venetian Republic. In August 1849, he was forced to resign, and to seek for safety in exile. He then came to Paris with his daughter and forty of his most devoted followers. The remaining years of his life were principally passed in collecting documents relating to the present history of Italy. He died in 1858.

MANTELL, GIDEON A., LL.D., F.R.S., &c., was born at Lewes, in 1796. His early life was clouded with difficulties. His father was a shoemaker, and his education was limited to the simple teaching of a village school; but his attention to study and his general quickness of parts attracted the attention of Mr. Cooper, the leader of the political Whig party; and through him he was apprenticed to a surgeon and apothecary. He so far ingratiated himself into the good graces of his master, that after he had walked the hospitals in London he was taken into partnership. In the course of his practice he was eminently successful, especially in cases of midwifery. At a very early period of life, young Mantell had devoted himself to the study of natural history; and at every moment of leisure he now entered deeply into the investigation of the 'Organic Remains of a former World,' first in the chalk and next in the Wealden formations. In 1822 he published by subscription the result of his labours, under the title of 'The Fossils of the South Downs, or Illustrations of the Geology of Sussex,' with engravings executed by his wife. In 1825 he was elected a Fellow of the Royal Society; and in 1829 the Society conferred upon him the royal medal for his memoir on the Iguanodon, which was printed in the Philosophical Transactions. In 1835 he quitted Lewes for Brighton; but in 1838 he removed to Clapham, near London; having previously disposed of his collections to the British Museum for the sum of 5000*l*. His professional practice not having increased by his removals, he was enabled to devote himself to literature and general science, and many valuable works were the result of his labours; among others, 'The Wonders of Geology;' 'The Medals of Creation' (1844); 'Thoughts on a Pebble;' 'Thoughts on Animalcules;' 'A Geological Excursion round the Isle of Wight;' 'Petrifactions and their Teaching,' &c. As a lecturer, as well as an author, Dr. Mantell was eminently successful. He had received his diploma of LL.D. from an American university. He died in 1852.

MANUAL EXERCISE, in military matters, a regulated method, taught to officers and soldiers, in order to render them familiar with the manipulation and use of fire-arms, and of acquiring facilities in military movements when under arms.

MARABOU-FEATHERS, the under tail coverts of the *Ciconia Marabou*, and the *C. Argala*, the latter being the adjutant-crane of tropical India, which furnishes the best specimens. The feathers are very light, and exceedingly valuable for head-dresses, especially the white ones.

MARBLE, FIGURES IN RELIEF ON. According to a new method, lately discovered, figures may be traced in relief on marble with chalk; after which they are covered with a coat of varnish made of the common Spanish sealing-wax dissolved in spirits of wine. A mixture of equal spirits of acid of salt and distilled vinegar is then poured upon the marble; this corrodes the ground, while the figures remain in relief, as if engraved. By this means the cost of engraving is saved.

MAR'CELINE, a mineral of a vitreous lustre and greenish-black colour, so called from its having been found at *St. Marcel*, in Piedmont. Its constituents are—oxide of manganese, 75·80; silica, 15·17; oxide of iron, 4·14; alumina, 2·80.

MARCEL'LIANS, an early sect of Christians, founded by *Marcellus* of Ancyra towards the close of the second century. He taught that the Son and Holy Ghost were two emanations from the Divine Nature, which were to return into the substance of the Father, after performing their respective offices.

MAR'GARITE (Gr. *a pearl*), a thin laminated mineral (Pearl-mica), of a yellowish-white, or greyish-red colour. It is found at Sterzing, in the Tyrol. Specific gravity, 3·0.

MARIA LOUISA, wife of Napoleon I., and ex-Empress of the French, was the eldest daughter of Francis I., Emperor of Austria, and born in 1791. In 1810 she was married to Napoleon Bonaparte, and in 1811 presented him with a son, who died at an early age. On the departure of the emperor for the army, in 1813, she was nominated regent. After the tide of affairs had turned against her husband, she declined, in 1813, to accompany him to Elba on the plea of ill-health. She afterwards obtained the Duchies of Parma and Placentia, by treaty with the allied powers, and subsequently contracted marriage with her chamberlain, Count Neipperg. Perhaps no part of Italy was worse governed, or immersed in greater poverty, than the duchies she governed. She died in 1847.

MAR'MATITE, a mineral of a dark colour and lamellar structure, which appears to be a sulphuret of zinc combined with sulphuret of iron. It is so called from *Marmata*, in the province of Popayan, South America, the place where it is found.

MAR'MOLITE, a mineral of a greyish-green colour (the silicate of magnesia), found at Barehills, near Baltimore, U. S. Its specific gravity is 2·47; and its constituents are magnesia, silica, lime, and water.

MARMONT, MARSHAL, AUGUSTE FREDERIQUE LOUIS VIESSE DE, DUC DE RAGUSA, was born of noble parents at Chatillon-sur-Seine. He entered the army at an early age, and first attracted the attention of Bonaparte, at Toulon, from the skilful management of his guns as an artillery officer, and also at the battle of Marengo, in which he bore a conspicuous part. As a general of division he gradually rose, like others, with his imperial master. He fought

through all the campaigns in which Austria, Prussia, and Russia were successively brought to terms, between 1805 and 1807. Two years afterwards he was engaged in the great battle of Wagram; and there so prominently distinguished himself that he was made Duke of Ragusa and Marshal of France. During the heat of the Peninsular war he was sent to replace Massena as commander-in-chief of the army in Portugal; but in September, 1811, he was signally defeated by the Duke of Wellington at Fuente Guinaldo. He was afterwards beaten by the English at Salamanca, and obliged to retreat.

Marmont was actively engaged in the scenes that followed the French reverses in Russia. He fought at Lutzen and Leipsic; and as the allied forces advanced upon Paris, he was charged, in conjunction with Mortier, to protect the fortunes of Paris. After the inevitable surrender of that city he adhered steadily to the Bourbons; and on the escape of Napoleon from Elba he retired to Ghent with Louis XVIII. In 1830, when another revolution appeared inevitable, he was charged with the invidious command of the army of Paris against its insurgent citizens, in favour of Charles X. The result is matter of history. After that period he remained a voluntary exile in the territories of his ancient enemies; and an Austrian city became the final resting-place of the last Marshal of the French empire. He died at Venice in February 1852.

MARQUE, LETTERS OF, extraordinary commissions granted to the captains of privateers, or merchants, for the seizure of an enemy's shipping, or for making reprisals, in order to obtain a reparation for damages sustained, or the goods of which they have been deprived by strangers at sea. The granting of letters of marque, and the old system of privateering, which extensively prevailed during the last century and the beginning of the present one, have in a measure ceased, owing to the joint determination of England and France to effect their suppression.

MARRIAGE ACT. On the 1st of January, 1857, a New Marriage Act, which was passed the previous session, came into operation. According to its provisions, every notice of marriage at the registrar's office is to be accompanied by a solemn declaration made by one of the parties, that there is no lawful hindrance to such marriage. All persons making wilfully false declarations are to suffer the penalty of perjury. A notice of marriage without licence is to be affixed to the superintendent's office; but notice of a marriage by licence is not to be suspended. Among other provisions on the subject, there is one to the effect that after a marriage at a registry office the service of the church or persuasion to which the parties belong may be duly performed; but no ceremony is to take place at the registry office. Further, the Act provides that Quakers or Jews may have licences for the solemnization of marriage. A Superintendent Registrar may grant a licence for marriage to be solemnized in registered buildings out of the district wherein the parties reside.

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through all the campaigns in which Austria, Prussia, and Russia were successively brought to terms, between 1805 and 1807. Two years afterwards he was engaged in the great battle of Wagram; and there so prominently distinguished himself that he was made Duke of Ragusa and Marshal of France. During the heat of the Peninsular war he was sent to replace Massena as commander-in-chief of the army in Portugal; but in September, 1811, he was signally defeated by the Duke of Wellington at Fuente Guinaldo. He was afterwards beaten by the English at Salamanca, and obliged to retreat.

Marmont was actively engaged in the scenes that followed the French reverses in Russia. He fought at Lutzen and Leipsic; and as the allied forces advanced upon Paris, he was charged, in conjunction with Mortier, to protect the fortunes of Paris. After the inevitable surrender of that city he adhered steadily to the Bourbons; and on the escape of Napoleon from Elba he retired to Ghent with Louis XVIII. In 1830, when another revolution appeared inevitable, he was charged with the invidious command of the army of Paris against its insurgent citizens, in favour of Charles X. The result is matter of history. After that period he remained a voluntary exile in the territories of his ancient enemies; and an Austrian city became the final resting-place of the last Marshal of the French empire. He died at Venice in February 1852.

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A very different mode of cooking should be adopted when it is wished to eat the meat. The muscular fibres of flesh in its natural state are everywhere surrounded by a liquid containing dissolved albumen. When this is removed by boiling with water, the muscular fibre becomes hard and bony, and this hardness increases the longer it is boiled. 'It is obvious, therefore,' observes Liebig, 'that the tenderness of boiled meat depends upon the quantity of albumen deposited between the fibres, and there coagulating: for the contraction or hardening of the fibres is thereby, to a certain extent, prevented. If the flesh intended to be eaten be introduced into the boiler when the water is in a state of brisk ebullition, and if the boiling be kept up for some minutes, and then so much cold water added as to reduce the temperature of the water to 165° or 158°, the whole being kept at this temperature for some hours, all the conditions are united which give to the flesh the qualities adapted to its use as food. When it is introduced into the boiling water, the albumen immediately coagulates from the surface inwards, and in this state forms a crust or shell, which no longer permits the external water to penetrate into the interior of the mass of flesh. But the temperature is gradually transmitted to the interior, and there effects the conversion of the raw flesh into the state of boiled meat. The flesh retains its juiciness, and is quite as agreeable to the taste as it can be made by roasting.'

MEAT-BISCUITS, AMERICAN. These biscuits, made of a kind of preserved meat, are principally manufactured at Galveston in Texas. The vast prairies of that portion of the American continent abound with excellent cattle, the flesh of which is on the spot converted into nutriment in a concentrated and portable form, thus saving the expense of transporting the cattle to the distant markets of more populous districts. In one pound of this biscuit the essence of five pounds of meat is concentrated; and a 22-gallon cask contains the essence of 500 lbs. of fresh meat, with 70 lbs. of flour. These biscuits may be easily preserved in any climate, and are in very general use in America. The method of making them is as follows. Good beef is selected, and boiled by steam until all the nutritive qualities are extracted. The liquor is strained, allowed to settle, and then evaporated by heat to the consistence of thick treacle; the fat is skimmed off as it rises. While the liquor is yet hot, flour is added to it, and both are kneaded up into a stiff dough, which may then be rolled, pressed, made into biscuits, and baked. The biscuits are either kept whole or ground to powder, and preserved in air-tight cases. For making into soup the powdered biscuit is mixed with hot water, and boiled with the addition of salt and other condiments.

MEATH, County of (viii. 427–32). According to the census of 1851, the population was 140,750; inhabited houses, 23,991; area, 906 square miles, or 579,899 acres, nearly the whole of which is cultivated. The population of the principal places is as follows:—

Kells . 3660 | Navan . 3979 | Trim . 1905

MEDICAL STAFFS, OF THE ARMY AND NAVY. These are important departments of the British service, placed under especial regulations. That of the army is under the control of a skilful and experienced officer, usually stationed at headquarters, under the designation of Director-General. Next to him are five inspectors-general, thirteen deputy inspectors-general, and an organized corps of staff-surgeons. Different localities are assigned for the respective officers. Thus the senior inspector-general is stationed at Bengal, and the junior one at Chelsea Hospital. A deputy inspector-general of hospitals must have served five years at home, or three years abroad, in this rank, before he shall be eligible to the highest rank of inspector-general. Three or four medical officers, not under the rank of a regimental or staff surgeon, may be convened for the formation of a *medical board*, for the inspection of wounded officers, for the purpose of insuring them a provision for life agreeably to the pension regulations of the service.

The full pay, per diem, of the respective *Medical Ranks in the Army*, after actual service, is as follows:—

Inspector-General, twenty-five years' service, 2*l.*; twenty years, 1*l.* 18*s.*; ten years, 1*l.* 16*s.*

Deputy Inspector, according to the same gradations of service, 1*l.* 10*s.*, 1*l.* 8*s.*, and 1*l.* 4*s.*

Staff-Surgeon, first class, ditto, 1*l.* 4*s.*, 1*l.* 2*s.*, 19*s.* Regimental-Surgeon and Staff-Surgeon, 2nd class, ditto, 1*l.* 2*s.*, 19*s.*, 15*s.*; under ten years, 13*s.*

Assistant-Surgeons, ditto, 10*s.* and 7*s.* Assistant-Surgeons serving in the Horse, Life, or Dragoon Guards, receive about 1*s.* per diem in addition to the above rates. Half pay per diem, after service (in years):—

Inspector-General, thirty years, 1*l.*; twenty-five years, 15*s.*; twenty years, 12*s.*

Deputy Inspector, thirty years, 18*s.*; twenty-five years, 14*s.*; twenty years, 10*s.*; ten years, 8*s.*; under ten years, 7*s.*

Staff-Surgeons, thirty years, 16*s.*; twenty-five years, 13*s.*; twenty years, 9*s.* 6*d.*; ten years, 7*s.* 6*d.*; under ten years, 6*s.* 6*d.*

Regimental-Surgeons and Staff-Surgeons, second class, thirty years, 15*s.*; twenty-five years, 11*s.* 6*d.*; twenty years, 8*s.*; ten years, 6*s.*; under ten years, 5*s.* 6*d.*

Assistant-Surgeons, thirty years, 7*s.*; twenty-five years, 6*s.*; twenty years, 5*s.* 6*d.*; ten years, 4*s.*; under ten years, 3*s.*

The salaries of the *Navy Medical Departments* are as follow:—

Medical Inspector of Hospitals, on first appointment, per diem, 1*l.* 13*s.*; after five years' service, 2*l.* 2*s.*

Deputy Medical Inspector of Hospitals, on appointment, 1*l.* 17*s.* 6*d.*

Staff-Surgeons and Medical Storekeepers of Hospitals, on appointment, with less than twenty years' service, 16*s.* 6*d.*; above twenty years' service, 1*l.* 0*s.* 6*d.*

When serving afloat:—

Medical Inspector of Hospitals and Fleets, above five years' service as such, 2*l.* 2*s.*; under five years' service as such, 1*l.* 11*s.* 6*d.*

Deputy Medical Inspector of Hospitals and Fleets, 1*l.*

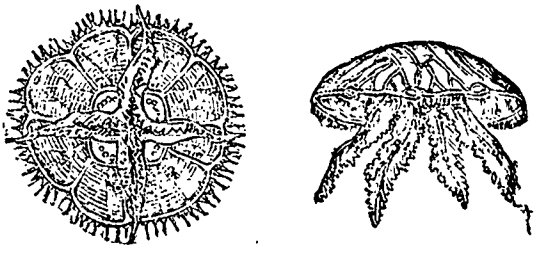
Surgeon of an Hospital ship, 18*s.*; above twenty years' full-pay service, including service as Assistant-Surgeon, 18*s.*; above ten years' ditto, 14*s.*; above six, 12*s.*; under six, 11*s.*

Assistant-Surgeon, in ships in which no Surgeon is borne, above ten years' full-pay service, 10*s.* 1*d.*; under ten, 9*s.* 1*d.*

In ships in which a Surgeon is borne, above ten years' full-pay service, 9*s.* 7*d.*; above three, 8*s.* 7*d.*; under three, 8*s.* 1*d.*

MEDU'SA, in classical mythology, one of the three Gorgons. She had been celebrated for her personal charms and the beauty of her locks; but Minerva, in revenge for a violation of the sanctity of her temple, turned her locks into serpents, which had the power of petrifying those on whom she looked. She was killed by Perseus, who placed her head upon the ægis of Minerva, which he had used in his expedition, and it retained its petrifying power as before.

MEDU'SA AURITA (viii. 454). 'In walking along the sea-beach, as the tide is falling,' says Mr. Dallas, in his able work on Zoology, 'the attention of the wanderer is often attracted by the number of singular gelatinous masses left on the sands. At first sight it would never be suspected that these are really living animals, endowed with a structure of considerable complexity; but a very little examination will soon show the observer that this is the case. If one of these lumps of jelly be put into a clear pool or basin of sea-water, parts, before confounded in a shapeless mass, immediately unfold themselves; a circular umbrella-like disc, surrounded by numerous short filamentous tentacles, appears to support the creature, at the surface of the water; and from the centre of this hang four long *arms* with membranous fringed margins. This is the *Medusa aurita*, the commonest Medusa of our coasts, which must have been observed by any one who has looked into the water from a boat or jetty in calm weather.'



MEDUSA AURITA.
(Lateral view, and under-surface.)

By the alternate dilation and contraction of this transparent disc, the creature is enabled to swim and move about in the water with freedom and ease. It is from the stinging power which some of the Medusæ possess, that they have received in all languages and all ages the name of 'Sea-nettles.' Thus the ancient Greeks called them *Akalephai*, or Nettles, a name applied to the large class of animals to which the Medusa belongs.

MEERSCHAUM PIPES (viii. 454). The editor of 'Novelties and Inventions,' in speaking of the extensive manufacture of these pipes at Vienna and Pesth, says, that the clay is procured not only in Asia Minor, but also in Greece, Moravia, and Spain. 'It is soaked in a liquified composition of wax, oil, and fat, the absorption of which occasions the colours assumed by the pipe after smoking. Occasionally the bowls are artificially stained by dipping them in a solution of copperas and other substances, before the application of the wax composition. The carving of the bowls is often difficult work, owing to the occurrence of a kind of clay mixed up with and harder than the meerschaum. The large quantity of parings left in roughing out the bowls would entail considerable loss, unless some process had been devised for using them. This has been done; the parings are employed in making the kind of meerschaum bowls called *massa*-bowls. The parings are ground to a fine powder, boiled in water, and moulded into blocks, with or without the addition of clay. The blocks are allowed to dry, and then a pipe-bowl is fashioned from each.'

MEERUT, a district of British India, in the presidency of Bengal, of which Meerut is the capital, situated 35 miles N.E. of Delhi. It forms an important military station for the British troops in the Upper Provinces of the Bengal presidency; and there are many remains attesting its former magnificence. It was here that the first mutinous outbreak of the sepoys, in May 1857, took place; when they marched to the city of Delhi, and being joined by others proclaimed the old deposed king as emperor. [DELHI; HINDUSTAN, *Supplt.*]

MEHEMET ALI, Pacha of Egypt, was born at Cavalla, in Roumelia, in 1769. He was one of the most remarkable men of the times in which he lived. In early life he was a humble tobacconist; but his tastes being more suited for a military life, he entered the army as a volunteer, when he was so fortunate as to gain the favourable opinion of the governor of Cavalla by his success in suppressing the pirates of that island. In 1799 he headed a contingent of 300 Candian soldiers in an expedition to Egypt, where he co-operated with the British forces for the expulsion of the French. It was here that he laid the foundation of his military renown and his vast political ascendancy. In a short time he was enabled to seize the pachalic of Egypt, through

the agency of the Mamelukes. In 1806 he was made Pacha of Cairo; and in the following year received the pachalic of Alexandria, as a reward for the services rendered to the Sultan of Turkey. But no sooner had he consolidated his authority, than he turned against his old confederates, the Mamelukes, 470 of whom were massacred in the citadel of Cairo, and 1200 in the country. Thus was the domination of a turbulent race, which had kept Egypt in anarchy and poverty for 400 years, utterly annihilated. After their destruction, Mehemet Ali had no difficulty in making himself master of Upper Egypt. He afterwards undertook the reduction of the Wahabis, and assisted the Sultan, though unsuccessfully, in his attempts to subjugate the Greeks. In 1830 he entered into a contest with the Sultan for the possession of Syria, when the superiority of his disciplined army became manifest, and in 1832 he succeeded in carrying his victorious arms within a few days' march of Constantinople; but the contest was settled by the intervention of the European powers; which is more a matter of history than of biography. For seven years subsequently Mehemet Ali retained the uncontrolled dominion of Egypt, and continued to direct his energetic mind to the internal improvements of his newly-acquired kingdom. He found Egypt a sterile waste, and he left it a powerful country, enriched with commerce, and strengthened by ships and armies. He died in 1849.

MELADER'MA (Gr. *μέλας* black, and *δέρμα* skin), a genus of fishes of the family *Zeidæ*, so called from the blackness of their skin.

[The Greek word *melas*, or *mela* (black), is very frequently used as a prefix to compound words in zoology, mineralogy, and other departments of science; as *Melafusus* (black-spindled), a genus of Mollusca, of the family Turbidæ, in which the shell is sub-fusiform, and the base contracted;—*Melampus* (black-footed), and *Melancantha* (black-spined), each of them a genus of Mollusca, of the family Turbidæ;—*Melania*, a genus of univalve fresh-water Mollusca, the shell of which has an epidermis, with a pointed spire;—*Melaniaceæ*, the Black Snails;—*Melanite*, an opaque and velvet-black species of garnet, the constituents of which are silica, lime, oxide of iron, alumina, and oxide of manganese;—*Melanella*, a genus of Mollusca, belonging to the Melanianæ;—*Melanochroite* (dark-coloured), a mineral found in Siberia, of a deep orange-red or hyacinthine colour, with a resinous lustre, and nearly opaque, the specific gravity of which is 5·75;—*Melantoma*, a genus of Mollusca, of the family Turbidæ, in which the shell is fusiform, and longitudinally ribbed;—*Melasoma* (black-bodied), a genus of birds belonging to the Dongo Shrikes, and of the family Laniadæ; also the name of a family of Heteromerous Coleoptera, consisting of dark ash-coloured beetles, which are mostly apterous.]

MELANOSPER'MEÆ (Gr. black seed), an important class of the *Algæ*, consisting of olive-green coloured plants, and including the following orders:—Fucaceæ, Sporoclinaceæ, Dictyotaceæ, Chordoriaceæ, and Ectocarpaceæ.

MELBOURNE, the capital of Victoria, on the South of Australia, situated on the mouth of the river Yarra-yarra, which empties itself into Port Phillip, lat. 37° 48′ S., and lon. 144° 57′ E. It was founded in 1837, and now extends above two miles along the river, with a breadth of one mile. It is a municipal borough, divided into four wards, the chief seat of the trade of Victoria, and the see of a Protestant bishop. The river is navigable to the town for vessels of 200 tons; but larger vessels are obliged to lie opposite Williamstown, about four miles distant. Melbourne, however, communicates daily by steamers with Geelong, on the west side of Port Phillip, and at stated periods with Sydney, Launceston, and Hobart-town in Van Diemen's Land. The town contains six churches, a court-house, government offices, a senate house, public schools, a college, several banks, British mechanics' institute, botanical gardens, and commercial storehouses innumerable. A railway has also been formed to Geelong, and others are in the course of formation in the interior, for the purpose of communicating with the gold diggings. In the neighbourhood are many prosperous farms, and the country residences of the more wealthy inhabitants. In 1848 the number of buildings was estimated at 2928; in 1853, 4980; in 1858, 11,158, with an assessed value of 995,945*l*. In 1850 the population was estimated at 20,000; but since that period it has more than doubled itself.

MELBOURNE, WILLIAM LAMB, VISCOUNT, Premier of England, was the second son of the first Lord Melbourne, and born in 1779. In early life he associated himself with the Whigs, and under their interest in 1805 was returned to the House of Commons. His talents, liberality, and independence of mind soon recommended him to political distinction. In 1827 he was appointed Secretary of State for Ireland, which office he resigned the following year. On the death of his father, which took place in 1828, he took his seat in the House of Lords; and on the formation of Lord Grey's administration, in 1830, he was appointed Secretary of State for the home department. On the retirement of Earl Grey, in 1834, he was elevated to the premiership. He died in 1848.

MEL'ILITE (Gr. *μέλι* honey, and *λίθος* a stone), a honey-coloured mineral, which occurs in minute grains in the cavities and fissures of lava. Its specific gravity is 3·24; and its constituents, silica, lime, magnesia, alumina, and oxides of iron, manganese, and titanium.

MELITE (Gr. *μέλι* honey), a mineral of a honey colour, found in Thuringia, and generally known as Honey-stone. It is something like amber, but distinguished from it by its weak electricity and double refraction. Its specific gravity is 1·60, and its constituents are melitic acid, alumina, and water.

MENDELSOHN. [BARTHOLDY, *Suppl.*]

MERCY-SEAT (Heb. כַּפֹּרֶת *caphoreth*, expiation), among the Jews, the covering of the ark of the covenant, or of the holy chest, in which the sacred tables of the law were deposited. 'At each end of this cover,' says Calmet, 'was a cherub of beaten gold, which, stretching out their

wings towards each other, formed a kind of throne, where the Lord was considered as sitting. Hence the Hebrews invoked Him sometimes as He who sitteth upon the Cherubim.' The ark itself was, as it were, his footstool; and it was from this place that the oracles of God were supposed to be delivered to Moses. Dr. Kitto observes that 'the lid of the ark was no doubt the seat of mercy; but it was mercy conferred through the act of expiation.'

MERIONETHSHIRE, N. Wales (viii. 490–92). According to the census of 1851, the population of the county was 38,843, and the number of inhabited houses, 8159. The area was estimated at 602 square miles, or 385,291 acres, of which about 50,000 are arable. The population of the principal places was as follows:—

Bala	1275	Dolgelly . . .	2041
Barmouth . .	1000		

MESNE, in law, a term denoting *intermediate*, or *intervening*. Thus *Mesne process* is generally used in contradistinction to *final* process, and signifies a writ or process issued between the commencement of an action, and the suing out of final process, or execution. By a recent statute the power of personal arrest on mesne process is abolished; and a capture cannot take place until final judgment has been given.

MESOLE, a mineral of a yellow or greyish-white colour, and pearly lustre. It is a flabelliform spar, and occurs in globules of a flat or lamellar structure, radiating from a centre. Its constituents are silica, alumina, lime, soda, and water.

MES'OLITE (Gr. *μέσος* middle, and *λίθος* a stone), a mineral which occurs in long slender prisms, terminated by translucent quadrilateral pyramids, of a greyish colour, and sometimes colourless; specific gravity, 2·26.

MES'OTYPE (Gr. *μέσος* middle, and *τύπος* form), a mineral occurring in trap rocks (the prismatic zoolite), of a yellowish-brown, red, or white colour. Its specific gravity is 3·2; and its constituents silica, alumina, soda, lime, and water.

MESSE DI CAPELLA, in music, a term used by the Italians as applicable to masses sung by the grand chorus; in which compositions there are various fugues, double counter-points, and other elaborate constructions. *Messe Concertati* are masses in which the recitation is intermixed with choruses. (Busby.)

METALS (viii. 502–4). The discoveries effected by the agencies of chemical and metallurgical science have been productive of many important changes in manufacturing economy. The ashes and cinders, the mere refuse of the foundries, formerly thrown away as worthless, have now assumed a commercial value. Thus brass ashes, which is the technical term for the ashes of a furnace in which copper and zinc have been melted to make brass, are no longer considered as worthless, but are found to contain enough of the mixed metals to render them profitable. 'The ashes,' says the author of 'Novelties and Inventions,' 'become a kind of substitute for copper ore, from which copper can be extracted by smelting. It is said that scarcely a dozen years ago brass-founders often paid money to have their ashes removed; but now there are 30,000 tons which can annually find a ready market, at from 10*s.* to 20*s* per ton. Even the slag which results from this smelting is useful, for it is in demand at Swansea to assist as a flux in smelting ordinary copper ore. The slag, or dross of iron furnaces, has, by the ingenuity of a French inventor, been made applicable to very useful purposes. By a careful process of casting or founding, this slag may be made into paving flags, large building blocks, and even pipes, of great hardness, polish, durability, and cheapness. Lead dross has a commercial value. It forms on the surface of lead while in the process of melting; and by careful processes it is made to yield up nearly the whole of the metallic lead which had become combined with it. Type-founders' dross, in like manner, or the dross which forms on the surface of molten type-metal, is made to yield up its metallic treasure by subsequent smelting.'

METROPOL'ITAN (Gr. *μήτηρ* and *πόλις*, the mother city), a term applied to the archbishop or first ecclesiastical dignitary of a province or country, who is supposed to reside in the *metropolis*, or chief city; whence the appellation. The establishment of metropolitans took place at the end of the third century, and was confirmed by the Council of Nice. The metropolitan had the general direction of ecclesiastical affairs. He was at the head of all other bishops of the province, and usually resided in the metropolis. The bishops of Nice, however, as well as those of Chalcedon and Berytus, though possessing mere honorary appellations, had precedence of other bishops, and bore the title of metropolitans, although they themselves were subject to the authority of their metropolitan.

MEYRICK, SIR SAMUEL RUSH, Knt., LL.D., F.S.A., &c., an eminent scholar and antiquary, was born in London in 1783. He was educated at the University of Oxford, and after taking his degrees he practised as an advocate in the Ecclesiastical and Admiralty Courts. But he soon began to devote himself to archæological researches; and his collections of ancient armour, with his learned illustrations in the work entitled 'Critical Inquiry into Ancient Armour,' &c., have established his reputation as one of the first authorities in all matters of this description. To the 'Gentleman's Magazine' he contributed innumerable articles on ancient arms and armour; and his knowledge and judgment were considered as unassailable. In 1832 he was created a knight of the Guelphic order, and afterwards a knight bachelor. He was also a deputy-lieutenant and magistrate of the county of Hereford. He died at his residence, Goodrich Court, in 1848.

MEZZA, and MEZZO (Ital., *middle, half*, or *mean*), in music, a term of very general application, and often united with other words; as *Mezza Bravura*, with an air of moderate passion and execution; *Mezzo-forte*, moderately loud; *Mezzo-piano*, rather soft. When used alone, and applied to the grand-pianoforte, it indicates that the pedal is to be used, by which one of the sets of strings is avoided. *Mezza-voce* signifies that the movement before which it is written is to be

sung or played in a soft and pleasing manner, with a moderate strength of tone. *Mezzo-barattere* is a term applied to airs of a moderate cast in point of execution, to excel in which requires a tolerable acquaintance with the *cantabile* and *bravura* styles. *Mezzo-soprano* is a treble voice of a moderate or somewhat low scale, and the lower species of the female voices. The *Mezzo-soprano Clef* is the C clef, when placed on the first line on the stave, in order to accommodate the Mezzo-soprano voice.

MEZZOFANTI, CARDINAL JOSEPH CASPAR, was one of those extraordinary characters who possess a kind of miraculous aptitude for the acquisition of languages, even to the minutest differences of idiom or dialect. He was born at Bologna, in 1774, and was the son of a carpenter, by whom he was intended for the same business; but Father Respighi, discovering his remarkable talents, placed him in the career of literary fame. Young Mezzofanti pursued his studies with great assiduity, until at length, in 1779, he was appointed professor of Arabic in the university of Bologna; and in 1803 he was named to the important professorship of Oriental languages; but the office was suppressed in 1808, which reduced Mezzofanti to comparative poverty. In 1812 his reputation, as a linguist, had become established. In 1814 he was reinstated in his professorship, and in 1815 became chief librarian of the institution. In 1817 Mr. Stewart Rose reported him as reading twenty languages, and speaking eighteen. Baron Zach, in 1820, states that the number of languages of which he was master was thirty-two; and Lord Byron, about that period, declared him to have been 'a walking polyglot, a monster of languages, and a Briareus of parts of speech.' In 1831 he settled at Rome, and soon afterwards succeeded the celebrated scholar, Angelo Mai, as keeper of the Vatican. In 1838 he was elevated to the dignity of cardinal along with his friend Mai.

It is difficult to state with accuracy how many languages Mezzofanti was acquainted with at the latter portion of his life; but the author of a memoir (Father Bresciani), which appeared soon after the cardinal's death, states that in the year 1846 he was informed by Mezzofanti himself that he was conversant with seventy-eight languages! thus proving that he was incomparably the greatest linguist of ancient or modern times; although as a writer, or author, he is comparatively unknown. At Rome he was in the habit of conversing with all the Propagandist missionaries in their own particular tongue or dialect; and indeed he appeared to possess a sort of mechanical gift in the acquisition of languages. It has been related that if 'he were addressed for the first time in a anguage or a dialect new to him, he listened with a wonderful power of attention, decomposed the sounds in his mind, searched for the analogues, and sought out the roots. In a short time all was clear to him;—he was master of the lexicon and the grammar of the hitherto unknown tongue.' He died at Rome in 1849.

MICROTOMA (Gr. *μικρὸς* small, and *τομὰ* a cutting), a genus of Mollusca, of the family *Muricidæ*, with a very short spire, and the pillar of the shell very broad, and curving inwards. Also a genus of twining shrubs, of the order *Asclepiadaceæ*, so called from the fascicles of hairs in the tube of the corolla.

MIDDLESEX (viii. 559-63). According to the census of 1851, the population of the county, independently of the metropolis, was 1,886,576; of which 882,823 were males, and 1,003,753 females. Of houses, inhabited and uninhabited, there were 251,236. The area was estimated at 180,168 acres, or 281 square miles, with 6683 persons to each mile. The population of the principal places, or parishes, independently of those enumerated under the head London, was as follows:—

Acton	2582	Hornsey	7135
Chiswick	6303	Isleworth	7007
Ealing	3771	Norwood	2693
Edmonton	9708	Old Brentford	6057
Enfield	9543	South Mimms	2825
Finchley	4120	Staines	2577
Hampton	4802	Stanwell	1723
Hanwell	1547	Sunbury	2076
Harefield	1498	Teddington	1144
Harrow-on-the Hill	4951	Tottenham	9120
Hayes	2076	Twickenham	6256
Hendon	3333	Uxbridge	3236
Heston	4961	Waltham Abbey	2329
Hillingdon	6352	Willesden	2939

MID'DLETONITE, a mineral of a reddish-brown colour, with a resinous lustre, so called because found in the *Middleton* collieries. It occurs in thin plates or in rounded masses between layers of coal. Its constituents are carbon, 86·44; hydrogen, 8·00; oxygen, 5·56.

MILIO'LOLA (Lat. *milium* a millet seed), in conchology, a family of Foraminifera, consisting of microscopic multilocular univalves, not larger than a millet seed. The miliolola is extensively found as a fossil, under the name of *Miliolite* (millet-seed stone); and forms the chief portion of the stony masses found in some of the quarries of Paris and its neighbourhood.

MILITARY ACADEMY, a royal institution, situated on Woolwich Common, intended for the education of gentlemen cadets. The building is castellated, and consists of a noble centre and two wings, united by corridors, with an ample range of building behind, containing the hall, servants' offices, &c. The academy was first instituted about the year 1719, but not finally completed and arranged until 1741. The officers of the artillery and engineers are invariably educated at this academy. Their nomination as cadets is made by the master-general of the ordnance; their age being fourteen or fifteen years. After undergoing the regular periodical examinations they are selected for commissions. These examinations are very strict. Independently of the general routine of juvenile education, the candidates are expected to be well acquainted with algebra, geometry, classical and modern languages, geography, history, drawing, &c. The officers rise by regular gradation, from the rank of second-lieutenant to that of colonel.

There are also many other military establishments connected with the army—as the *Military Asylum* at Chelsea, which is intended for the education of the children of soldiers, and maintains and educates 350 boys, at an expense of 18,000*l.* per annum. The *Military College* is also an institution established at Sandhurst, for the education of gentlemen cadets.—*Addiscombe Seminary*, near Croydon, in Surrey, is likewise for the education of young gentlemen intended for the military service of the Honourable East India Company.

The confidential secretary at the Horse-guards is styled the *Military Secretary*. His duties are to conduct the military correspondence of the commander-in-chief, and to transact the official business of the army, so far as regards the rank and precedence of officers, &c.

MILITIA. The militia force of the country has been reconsolidated by stat. 15 and 16 Vict. c. 50; and 18 and 19, c. 1; by which they cannot serve out of the kingdom, except by consent of Parliament.

MILK (viii. 577). Milk may become solidified, so as to keep for any length of time, and be grated and dissolved in water for use. To effect this object, 28 lbs. of white sugar, and a teaspoonful of bi-carbonate of soda, must be added to 112 lbs. of fresh milk. The mixture is then evaporated in a water-bath at a moderate temperature, and stirred and agitated all the while, but so moderately as to avoid churning. In three hours it assumes a pasty consistency, and by constant manipulation and warming it is reduced to a rich creamy-looking powder. It is then exposed to the air to cool, weighed into parcels of a pound each, and pressed into a brick-shaped tablet, which is covered with tin foil. This will keep for any length of time, and may be grated and dissolved in water for use, answering all the purposes of ordinary milk, even to the making of butter. (*Medical Recorder.*)

MILK-TREE, of South America. [PALO DI VACA.]

MILLENA'RIANS, among the early Christians, a sect who maintained that Christ was to come and reign with his saints upon earth for a thousand years, and that, at the expiration of this term, the day of judgment was to take place. These opinions appear to have been founded chiefly on the 20th chapter of Revelation, 'They lived and reigned with Christ a thousand years,' &c. The sect is supposed to be as old as the second century, and to have been introduced by Papias, Bishop of Hierapolis, and disciple to St. John the Evangelist. Justin Martyr, who flourished in the second century of the Christian era, was a great supporter of the Millenarian doctrine, which he declared was the belief of all orthodox Christians. But it is evident, from the writings of Eusebius, Irenæus, and others, that it was never adopted by the whole of the Christian Church, or made an article of the established creed in any nation. Origen, the most learned of the Fathers, and Dionysius of Alexandria, both wrote in opposition to the doctrine that prevailed in their day. On the other hand, Dr. Burnet and others maintain that the belief was very generally admitted until the Nicene Council, in 325. In the fourteenth century Pope John XXII. preach up the doctrine; and in the time of Cromwell there arose a set of enthusiasts, called *Millenarians*, or *Fifth Monarchy Men*, who expected and preached the sudden appearance of Christ to establish on earth a new kingdom or monarchy.

To a limited extent the doctrine of the Millenarians is still prevalent both among Jews and Christians. Though rejected by the Church of Rome, as well as by the Reformed churches, it has long and often been discussed by members of both those communions, among whom there are, at this present day, many believers.

MILLER, HUGH, a distinguished geologist, was born at Cromarty, N.B., in 1802. He was of humble origin; but by his never-ceasing assiduity he succeeded in rendering his name conspicuous in the literary world. Having gained the confidence of the Free-Church party in Scotland, by an energetic letter to Lord Brougham on the Auchterarder case, he was selected as editor of the 'Witness,' which was the organ of the Free Church. A series of geological papers published in this journal excited the attention of the Geological Association at Glasgow in 1840. Sir C. Lyell, Sir R. Murchison, Dr. Buckland, and Professor Agassiz, expressed their admiration at the stores of geological information he poured forth. These papers were afterwards published in one volume, under the title of 'The Old Red Sandstone, or New Walks in an Old Field.' This production was very successful, and still remains one of our most popular works on the science of geology. It was followed by a variety of other works;—as 'First Impressions of England and its People;' 'Footprints of the Creator;' 'The Geology of the Bass;' 'Fossil Flora of Scotland,' &c., besides various lectures delivered in Edinburgh and London on geological subjects. He died in 1856 by his own hand, in a paroxysm of mental aberration, brought on by excessive application to a work called 'The Testimony of the Rocks,' which was completed the day before his death, and afterwards published.

MILL-STONE, a stone for grinding corn, drugs, minerals, paints, &c. In the operation of grinding corn, millers have two horizontal stones one above another, between which the corn is ground by the rotation of the upper stone—the agents for the rotating process being wind, water, or steam. In the centre of the upper stone there is a circular orifice through which the corn falls; and the fineness to which it can be ground depends upon the distance between the stones, which can be readily adjusted. The surfaces of these stones are furrowed with channels radiating from the centre to the circumference; and these furrows, meeting each other in opposite directions, act like the blades of a pair of scissors, and convey the flour to the edges of the stones, where it is received into a box or trough.

The procuring of mill-stones, of a proper and sufficiently hard quality, is often attended with difficulties. It is not every country that produces the material. Germany and France are the most productive. About ten miles from Coblentz,

on the Rhine, are the mill-stone quarries of Nieder Mendig, which have been worked from the earliest periods of European history. Seven quarries have been excavated to the depth of fifty or sixty feet. The stones are very hard; and there is great labour attending the working of them. When made they are conveyed to Andernach, and from thence floated on large timber rafts down the Rhine to Holland, where they are sold and dispersed throughout Europe. In France there is found a kind of burr stone, so hard and flinty that a pair of stones will sometimes last twenty or even thirty years, and when worn can be fresh cut. In our own country the Welsh or Derby stones are chiefly used for grinding barley, oats, and rye; the Derby stones being about one-fourth the price of French; but they are much inferior in hardness and durability.

In the United Kingdom there are upwards of thirty makers of mill-stones, who produce about 1100 pairs of large mill-stones annually, besides a great number of smaller manufacturers, and others who are engaged in pressing burr-stones, &c. The weight of the stones annually made is estimated at 2500 tons. The ordinary size of a mill-stone is four feet diameter by ten inches thick. It is composed of twenty to thirty burr-stones, and weighs from twelve to sixteen hundred weight.

MIMI, or MIMES (Gr. *μιμέομαι* to imitate), among the classical ancients, were theatrical buffoons, or *pantomimic* actors, who entertained the spectators by their burlesque imitations of certain characters. These mimi were first introduced upon the Athenian stage to succeed the chorus and comedies, and divert the audience with their tricks and gesticulations. They made their appearance on the Roman stage long after tragedy and comedy had arrived at perfection. They then wore no masks, but smeared their faces with soot or paint, wore garlands of ivy, and carried a basket of flowers in honour of Bacchus. In modern times the mimes were a kind of vocal and mimic actors, formerly very numerous in France, and much encouraged in Italy, England, and other countries of Europe.

MIMO'SA GRANDIFLO'RA (viii. 585, x. 850), the large flowering sensitive plant, frequently found in the mountainous districts of the East Indies, and other tropical climates. Its characteristics are very peculiar. It grows to the size of a moderate tree; but does not possess, like the *Mimosa pudica* (the common sensitive plant), the power of retracting its branches, so as to set the whole plant in motion on the approach of a living animal. Its sleeps at regular periods, by closing its two corresponding leaflets together; and the flowers are so rapid in their growth as to give them the appearance of spontaneous motion. It secretes a very agreeable kind of honey, which affords a delightful food to the humming bird.

MINA, an ancient coin of Greece, worth 100 drachmæ, or about 3*l.* sterling. Sixty of these minæ made an Attic talent.

MINERALOGY, and MINERALS (viii. 587). The mineral wealth of the United Kingdom is almost beyond calculation, and presents one of the most extraordinary phenomena in the history of our social economy. Perhaps the nearest approximation to the truth has been given by Mr. Robert Hunt, of the Museum of Practical Geology, and Government Keeper of Mineral Records. He has estimated the value of the mineral productions of the United Kingdom upon the principle of taking the mean average price of all the substances of the mine, colliery, or quarry, before any charges for carriage have been made, or cost added for manufacture; and they stand thus:—

	£
Tin ore	663,850
Copper ore	2,343,960
Lead and silver	1,431,509
Zinc ore	27,455
Iron pyrites	46,066
Iron ore	5,695,815
Arsenic	1,911
Nickel and uranium	527
Coals	16,663,862
Salt	553,993
Barytes, &c.	10,000
Porcelain, &c.	120,896
Building stones	3,042,478
	£30,602,322

We thus perceive that coal is the most valuable of all our mineral products; and it appears that nearly one-fourth of the whole amount raised in the United Kingdom is the produce of the mines of Durham and Northumberland. Those two counties are being undermined at the rate of fifteen millions of tons per annum, and yet, say geologists, we have no need to fear our supply of coal falling short for some hundreds of years. Yorkshire yields nine millions of tons per annum, and Lancashire nearly the same.

Mr. Hunt has also published estimates of the market value of the manufactured metals as follow:—

Tin	£808,241
Copper	2,846,803
Lead	1,755,096
Silver	153,547
Zinc	225,075
Pig-iron	14,545,508
Other metals	100,000
Other mineral products, exclusive of building stones	17,348,751
Total	£37,783,021

MINES (viii. 588). The 'Mining Journal' presents a very interesting account of the depths of various mines in different parts of the world. It states that the Wheal Abraham, in Cornwall (rather more than twenty years ago), had attained a depth of 242 fathoms; and Dalcoath mine, 235 fathoms; and those depths have been regularly increasing. The Tresavean mine is reported, at the present time, to be 352 fathoms, or 2112 feet in depth, and about 1700 feet below the level of the sea. The Consolidated mines are 300 fathoms, or 1800 feet deep, and the United mines 280 fathoms below the adit level.

Speaking of mines generally, it may be ob-

served that the Eselschacht mine at Kuttenberg in Bohemia, now inaccessible, was deeper than any other mine, being no less than 3778 feet below the surface. Its depth is only 150 feet less than the height of Vesuvius, and it is eight times greater than the height of the pyramid of Cheops, or the Cathedral at Strasburg. The bore of the salt works of Minden, in Prussia, is 2231 feet deep, and 1993 feet below the level of the sea. Mines on high ground may be very deep without extending to the sea level. That of Valenciana, near Guanaxuato in Mexico, is 1686 feet deep; yet it is 5960 feet above the level of the sea, and the mines in the Andes must be much more. For the same reason the rich mine of Joachimsthal, in Bohemia, though 2120 feet deep, has not yet reached the sea level.

MINIE RIFLE, a new species of military firearm, in which the ball, instead of being round, is conical; the base being concave, and the conical or pointed end being driven towards its object with much more force and velocity than the common ball.

MINIE RIFLE BALL.

It received its name from Captain Minie, the inventor. Its aim is certain; and at 800 yards' distance its results are fatal. It has been known to strike a target seven times out of ten shots at a distance of 1804 yards, the target being about eighteen feet high, and 100 feet in length. In our late contests with Russia and China it has been found very effective. The *Enfield Rifle* is an improvement on the Minie. [MUSKETRY, *Suppll.*]

MINOR CANONS, those clergymen of a cathedral who occasionally assist in the performance of the service and anthem.

MINT (viii. 600). In 1850 a committee of the House of Commons was formed, for the purpose of inquiring into the subject of official salaries; and from their report it appears that the staff of the mint consists of 'the master and worker,' who has a salary of 1500*l.*; the deputy-master and comptroller, 890*l.* 10*s.*; the registrar and accountant, 244*l.* 2*s.* 1*d.*; four senior clerks at average salaries of 372*l.* 10*s.*; six junior clerks at average salaries of 173*l.* 10*s.*; an office-keeper, 150*l.*; a housekeeper, 150*l.*; three messengers (average salary), 86*l.* 10*s.*; five packers and tellers (average salary), 85*l.* 10*s.*; the superintendent of the coining department, 700*l.*; resident engraver, 252*l.* 10*s.*; foreman of die workshops, 250*l.*; foreman of press-room, 220*l.*; in addition to whom there are numbers of artificers and others employed in the various processes connected with the coinage. Previous to appointment all these officers are subjected to examination more or less severe, according to the importance of the appointment, particularly in handwriting and orthography, arithmetic and bookkeeping, English composition and history, political economy, elements of mechanical science and of chemistry, &c.

According to the civil-service estimates for 1858-9, the sum required for defraying the expenses for the year ending 31st of March, 1859, is 36,639*l.* But in these expenses are included 2745*l.* for new machinery, consisting of a steam-engine, weighing beam, mould for gold-casting, and steel rolls. The officers and workmen of the establishment number ninety-five; and their salaries and wages amount to 11,735*l.* 13*s.*

From a recent parliamentary paper, it appears that the amount of gold, silver, and copper moneys, coined since 1843 was 84,004,044*l.*, as shown in the annexed table of each year's coinage.

Year.	Gold.	Silver.	Copper.
1843 ..	£6,607,849 ..	£276,606 ..	£10,080
1844 ..	3,563,949 ..	626,670 ..	7,246
1845 ..	4,244,608 ..	647,658 ..	6,944
1846 ..	4,334,911 ..	559,548 ..	6,496
1847 ..	5,158,440 ..	125,730 ..	8,960
1848 ..	2,451,999 ..	35,442 ..	2,688
1849 ..	2,177,955 ..	119,592 ..	1,792
1850 ..	1,491,836 ..	129,096 ..	448
1851 ..	4,400,411 ..	87,878 ..	3,586
1852 ..	8,742,270 ..	189,596 ..	4,312
1853 ..	11,952,391 ..	701,544 ..	10,190
1854 ..	4,152,183 ..	140,480 ..	61,538
1855 ..	9,008,063 ..	195,510 ..	41,091
1856 ..	6,002,114 ..	462,528 ..	11,418
1857 ..	4,859,860 ..	373,230 ..	6,720

For the following condensed account of the mintages of England we are indebted to Dr. Nuttall's 'Archæological Dictionary.'

'Though the coining of money was always a special prerogative of the kings of England, yet the ancient Saxon princes communicated it to their subjects; so that in every town there was at least one mint; but in London there were eight; at Canterbury, four for the king, and two for the archbishop; one for the abbot of Winchester; six at Rochester; two at Hastings; and so on. Athelstan appears to have been the first monarch who enacted any regulations for the government of the mints. In his laws, which were promulgated about the year 928, he provided that one sort of coin only should be current throughout the kingdom, and granted to various towns, by name, a number of moneyers proportionate to their size and consequence, and to all boroughs of inferior rank one moneyer each. These mints were under the control of that within the tower of London; from whence, as paramount, the dies were issued; for which the moneyers paid a regular fee upon every alteration of the coins. They also paid an annual rent, which in the city of Lincoln amounted to 75*l.* The Norman kings continued the custom of coining only pence, with the king's image on one side, and on the other the name of the city where it was coined with a cross so deeply impressed, that it might be easily parted and broken into two halves, which, so broken, they called *half-pence;* or into four parts, which they called *fourthings*, or farthings. During

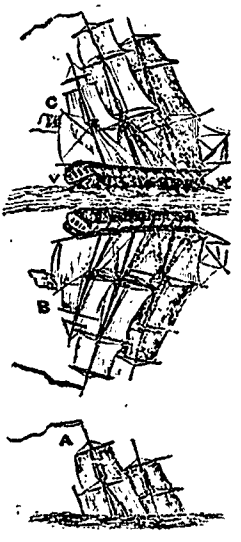
the Middle age, there were other mints, besides the subordinate ones belonging to the crown, of which it is necessary that some account should be given. They were founded either upon usurpation, or upon grants from the sovereign to individuals, or to bodies of men, on account of the offices held by them. Of the first kind were those unauthorized mints, which abounded in the turbulent reign of Stephen, when every temporal and spiritual baron considered himself as the king of his peculiar district; and presuming upon the weakness of the executive government, assumed all the prerogatives of royalty, and especially that valuable one of striking money. From the accounts given by historians, it would seem that immense quantities of these coins must have been struck, and it is therefore difficult to conceive in what manner they have been so effectually destroyed, that not one of them should have reached our times. The grants from the crown, which authorized individuals to coin for their own profit, were confined solely to ecclesiastics,—to archbishops and bishops, and also to some abbots of the higher order. The dies which they were permitted to use were at first for pennies only; for Edw. III. granted to the abbot of Reading power to coin half-pence and farthings, as well as pennies which had been usual. In later times, half-groats were struck by the archbishops of Canterbury and York; and some groats by the latter archbishop. The series of metropolitan and other ecclesiastical coins, terminates in the reign of king Henry VIII.; Cranmer, archbishop of Canterbury, and Lee, archbishop of York, being the last who exercised the privilege of striking money. But it was not until the reign of Mary that the custom of coining in the subordinate royal mints entirely ceased. The whole of her money was struck in the Tower, where the coinage was afterwards exclusively conducted, except for a short period during the troublesome reign of Charles I. and a small portion of that of his son; and likewise during the great re-coinage in the reign of William III., when mints were opened in York, Chester, Exeter, Bristol, and Norwich, for the more speedy circulation of the new money in the counties distant from the metropolis.'

Of late years, however, the provincial mints have gradually given way to one universal system; and at the present time the vast coinage of the United Kingdom is carried on in that very important establishment—the MINT, situated near the Tower of London.

MI'OCENE (Gr. *μεῖον* less, and *καινὸς* recent), in geology, a subdivision of the tertiary formation, intermediate between the eocene and the pliocene strata, and consisting of limestones and clays of various kinds. This middle stratum contains many of the extinct genera of lacustrine mammalia, with the earliest forms of existing genera; as, for instance, the agnotherium, ape, dinotherium, felis, gulo, hippopotamus, hippotherium, horse, machairodus, mastodon, rhinoceros, sus, tapir, tetracaulodon, and numerous fresh-water and marine shells. 'The deposits included in this division,' says Milner, 'are characterized by their fossil contents presenting a greater admixture of extant with extinct species than the eocene beds, and, by their overlying position, when the latter are present, denoting their later accumulation. They are likewise far more extensive, and occupy an immense space of the area of Europe. In the ancient province of Touraine, what are provincially called the Faluns or marls of the Loire, are miocene tertiaries. They occur in the basin of that river, and consist of an extensive formation of marl beds, a series of marine strata, resting upon the upper fresh-water group of the Paris basin.—The Touraine marls contain terrestrial and river shells, as well as marine, with the remains of land quadrupeds, and vertebrated animals of the ocean, intimating that here, anciently, the waters of a river encountered the sea in an estuary, the one drifting down the illuviatile and land organisms, and the other washing up the oceanic forms to be entombed in the strata deposited by the estuary, which passed away with the elevation of its bed.'

MIRAGE (viii. 603–5). Among the many remarkable appearances of this wonderful phenomenon, that of the Brocken (a vast peak of the Hartz Mountains) is one of the most curious. This peak rises about 3300 feet above the level of the sea, and has for ages been the site of spectral illusions. But the progress of science has effectually dissipated the popular belief in the supernatural visitations of this far-famed locality. The philosopher M. Haüe, who visited the place early on the morning of the 23rd of May, 1797, has thus described and explained the phenomenon. The sky was clear, and the rays of the sun were tinging the summit of the hill with their golden hue, when he saw a cloud, in a direction opposite to that on which the sun rose, towards the Achtermanshre, a gigantic human figure, with his face towards him. While gazing on the prodigious spectre, with something like a feeling of awe, a sudden gust of wind threatened to blow his hat away, and raising his hand to detain it, he saw the spectre mimic his action, which at once freed his mind from all superstitious terrors. On changing his attitude and position, he found that the figure imitated his motions. M. Haüe was then joined by a person who had accompanied him to the top of the mountain, when a second colossal figure made its appearance, and soon afterwards a third. The appearance of the third no doubt arose from the duplication of one of the figures by the then unequal refraction of the atmosphere. This peculiarity of the atmosphere sometimes gives rise to curious spectral illusions, such as inverted images, looming, and the mirage. Thus inverted images of ships have been discovered floating in the air,—an illusion arising from the phenomenon of atmospheric refraction. The principle has been clearly illustrated by Dr. Vince, who, in 1798, observed at Ramsgate a ship which appeared as at A in the accompanying drawing,—the topmast being the only part seen above the horizon. At B an inverted image of the ship was seen, directly above the real ship at A, and an erect image at C, both reflection and refraction being perfectly defined. As the ship rose from the horizon, the image, C,

gradually disappeared, and the image B descended. The images, B C, were perfectly visible when the whole ship was actually below the horizon.



This phenomenon of reflection and refraction may be explained on the principle of the atmosphere being in a very peculiar and hazy condition. The inverted image of the ship is seen in the reflecting condition of the atmosphere precisely as we behold the inverted image of any object held over the water into which we may be looking, or as we see our own image in a looking-glass. When a second ship is seen in the right position over the inverted one, it is manifestly a faint reflection, not from the original ship, but from the inverted one reflected from it.

MIRMIL'LONES (Lat. *mirmillo* a fencer), the name of a certain class of gladiators who fought with sword, head-piece, and shield against the Retiarii, who made use of a net in which they endeavoured to entangle their antagonists.

MISNA, or MISCHNA, the ancient code of Jewish laws, compiled by Judas, a learned Rabbi, about A.D. 180. He undertook to embody the unwritten or traditional law, which, as generally believed, was delivered by God to Moses, and orally preserved among the doctors of the synagogue. This code is divided into six parts; the first treats of agriculture; the second, of festivals; the third, of women and matrimonial cases; the fourth, of law-suits; the fifth, of sacrifices, obligations, &c.; and the sixth, of purifications, and the various forms attending them.

MISSELTOE (viii. 607). The trees on which the misseltoe usually grows are the apple, pear, hawthorn, almond, cherry, laurel, service-tree, ash, elm, mountain ash, hazel-elm, willow, lime, poplar, beech, and sometimes on coniferous trees. It is sometimes, but very rarely, found on the oak; but appears to be the commonest on the apple-tree, especially in Worcestershire and Herefordshire.

MITCHELL, COLONEL SIR T. LIVINGSTONE, the eminent geographical surveyor, was born at Craigend, co. Stirling, in 1792. In 1808 he entered the British army in Portugal, and on the termination of the war attained the rank of major. He was afterwards engaged to make surveys of the great battle-fields, in which he gave great satisfaction by the accuracy of his maps and plans. In 1827 he published 'Outlines of a System of Surveying for Geographical and Military Purposes.' In the same year he received the appointment of deputy surveyor-general of New South Wales, and afterwards became surveyor-general; which office he retained till his death. He appears to have been a most successful explorer of the Australian continent, having conducted four expeditions into the interior. In 1838 he published an account of three, which are replete with interest. In 1839 he received the honour of knighthood, and the title of D.C.L. from the University of Oxford. In 1845 he undertook a fourth and last expedition, an account of which was published, in 1848, under the title of 'A Journal of an Expedition into the Interior of Tropical Australia, in Search of a Route from Sydney to the Gulf of Carpentaria.' In 1850 he brought out an excellent manual of geography for the schools of New South Wales. In 1854 he was raised to the rank of colonel; and died at Sydney in 1855.

MITFORD, MISS MARY RUSSELL, the celebrated novelist, was born at Alresford, Hants, in 1786. She was the only daughter of a physician, whose extravagant habits reduced his daughter to the necessity of seeking the means of subsistence by the labours of her pen. Of her first appearance as an authoress she thus speaks in her autobiographical memoir:—'In my very early girlhood I had followed my destiny, as a pupil of Miss Rowden, by committing the sin of rhyming. No less than three octavo volumes had I perpetrated in two years. They had all the faults incident to a young lady's verses; and one of them had been deservedly castigated by the "Quarterly."' When the first series of 'Our Village' made its appearance, in 1806, on which Miss Mitford's fame is chiefly built, it received a very favourable notice from the 'Quarterly.' In 1812 appeared her poem of 'Watlington Hill,' which commemorates the coursing performed in that locality by the 'celebrated greyhounds belonging to Messrs. Newell, Hayward, Webb, Hunt, and Mitford.' Dramatic composition, however, was her favourite pursuit; and the principal works which appeared on the public stage were—'Julian,' 1823; 'Foscari,' 1826; 'Rienzi,' 1828; and 'Charles the First.' To the delightful sketches of 'Our Village,' four volumes were added, and the fifth and last in 1832. She afterwards published a volume of 'Country Stories,' included in 'The Parlour Library,' 1847; and edited three volumes of 'Stories of American Life,' by American authors. In 1852 she produced her 'Recollections of a Literary Life,' in three volumes. During the same year she brought out a new edition of 'Our Village;' and in 1854 her dramatic works were collected in two volumes 12mo. She died in 1855.

MITHRAS (Sanscrit, *mitra* the sun), the an-

cient deity of the Persians, and one of the names under which the sun was worshipped by the Romans. On the revival of the Persian religion, under the Sassanidæ, the mysteries and festivals of Mithras were celebrated with great splendour. In ancient statuary he is represented as a young man with a turban on his head, and kneeling on a prostrate bull, one of the horns of which he holds in his left hand, while with the right he is plunging a dagger into the animal's neck.

MITRE (Gr. *μίτρα*; Span. *mitra*), a sacerdotal head-covering, worn by certain abbots and bishops on solemn occasions. Like the tiara, or the cidaris of oriental kings, it appears to have been a regal or hierarchal head-covering from the earliest periods of history. It was worn by the sovereign pontiffs of the Hebrews; and in the papal ages it was generally adopted by the hierarchal dignitaries in imitation of the Greek emperors. Pope Alexander II. conceded the right of wearing it to various abbots; and at length it passed to secular princes and canons of churches.—*Mitred Abbots* were of great importance in the state. They were summoned to parliament as spiritual lords; though it does not appear that they sat by right of the mitres which the pope conferred upon them, but by virtue of the temporal possessions received from the hands of the king. (*Cowel.*)

MOLECULES [DIVISIBILITY OF MATTER; BODIES, NATURAL, *Suppl.*]

MOLESWORTH, RIGHT HON. SIR WILLIAM, Colonial Secretary, and M.P. for Southwark, was born in London, in 1810. He was descended from a very ancient and respectable Cornish family; and at the age of thirteen he succeeded his father in the family baronetcy. He was educated successively at the universities of Cambridge and Edinburgh, and ultimately in Germany, where he concentrated his intellectual powers, and studied history and philology. He first made his appearance in public at a Cornish county meeting, in 1831, as an advocate of parliamentary reform; and the following year, though a mere youth, he was returned as member for the Eastern Division of the county. He afterwards sat as M.P. for Leeds; and in 1845 he was returned as the liberal member for the borough of Southwark, which position he retained till the time of his death. In 1853 he was appointed First Commissioner of Public Works, and afterwards transferred to the chief secretaryship of the Colonial Office.

Sir William Molesworth's speeches in parliament were few, but always of a valuable character. Those on the colonies in 1838, and on the state of the nation in 1840, independently of many other important public questions, were of great merit and practical utility. He was a warm advocate of the ballot; and his parliamentary speech in its favour, when he stood alone in the cabinet on that open question, was honourable to his independence of character. But the tastes of the Right Hon. Baronet were not confined to political matters alone; he was devoted to the interests of literature. Some years ago he purchased the 'Westminster Review,' and for some time was his own editor. For a considerable portion of his life he had devoted himself to the collection of materials for a life of Hobbes, the 'Philosopher of Malmesbury,' which still remains unfinished. In 1839 he commenced, and afterwards completed, at a cost of some thousand pounds, a reprint of the entire miscellaneous writings of that distinguished but unpopular philosopher. The Latin and Philosophical works were issued in five handsome volumes; and the English works in eleven volumes.

As a public man Sir William was almost universally respected; and on the occasion of his death, which took place in 1855, all the public journals were unanimous in their laudations. 'Nature had endowed him,' said the *Times*, 'with a mind remarkably clear, sound, logical, and comprehensive. No man was more luminous in arrangement, or more clear and conclusive in argument.'—'The best monument that could be raised to him would be a complete collection of his parliamentary speeches;—the noblest epitaph that could be inscribed on his tomb would be the title of "The Liberator and Regenerator of the Colonial Empire of Great Britain."'

MOLTO (Ital. *very much*), in music, a word used in conjunction with some other by way of augmentation; as *Molto-Adagio*, very slow; *Molto-Allegro*, very quick, &c.

MONAGHAN, County of, Ireland (viii. 641). According to the census of 1851, the population was 143,410; inhabited houses, 35,078; area, 511 square miles, or 327,078 acres, about 20,000 of which are waste. The population of the principal places was as follows:—

Dallybay . .	1617	Clones . . .	2319
Carrickmacross	2529	Monaghan . .	3328
Castleblaney .	2077		

MONETA'GIUM, in the Middle age, a term applied to the right of coining money, or to the mintage where the money was coined. It was likewise the tribute paid by tenants to their lord every third year, when it was the custom for feudal lords to coin the money current in their territories. This tribute was given, in order that he should not change the money which he had coined.

MONEY. [MINT, *Suppl.*]

MONEY-ORDER, a Post-office form of transmitting small sums of money, by which orders are granted, payable at sight, for any small sums up to 5*l.*, on payment of a graduated fee of 3*d.* for any sum under 1*l.*, and 6*d.* beyond. In 1854 the number of money orders issued in England was 5,500,000, which represented nearly 10,000,000*l.* sterling. This convenient mode of remitting money has been recently extended to the colonies.

MONGO'LIAN RACES (viii. 649–51). Ethnologists have usually divided the great family of man into three distinct races—the white, or *Caucasian* [CAUCASIAN RACE, *Suppl.*], the Olive-coloured or *Mongolian* [viii. 651], and the *Negro*, or Ethiopian. The characteristic formation of the head in each race is very striking. Thus the Caucasian, to which the western Europeans, and the most civilized portions of the world belong, is

distinguished by the beautiful ovality and symmetry of the cranium.

CAUCASIAN HEAD.

The Mongolian race, inhabiting central and northern Asia, is distinguished by projecting cheek-bones in a line with the nose, flat face, and narrow and oblique eyes; while the Negro race, which has always been in the lowest stage of barbarism, is at once recognised by the receding forehead, the compressed skull, flattened nose, projecting muzzle, thick lips, and the large development of the occipital part of the forehead.

MONGOLIAN HEAD.

NEGRO HEAD.

The Mongolian race consists, chiefly of the Mongolian and Mantchou Tartars, and forms the vast empire of China. It has sometimes extended its conquests westward with the most devastating results; but its state of civilization, though infinitely superior to that of the negro race, has, for the last two thousand years, remained comparatively stationary. At three different periods their Mongolian ancestors, under Attila, Genghis Khan, and Tamerlane, spread the terror of their names throughout the Eastern world.

The origin of this race appears to have been in the vast range of the Altai Mountains; but its history is difficult to trace. The Chinese, however, who were anciently the most civilized people of the Mongolian race, have concentrated an empire of amazing extent; and, if we except some learned Chinese, the whole of the Mongolian race are of the religions of Foe and of Buddh. The Mantchous, who conquered China, the Japanese, the Coreans, and almost all the hordes extending to the north-east of Siberia, under Russian dominion, belong to this race.

MONMOUTHSHIRE (viii. 654–5). According to the census of 1851, the population of the county was 157,418; of which 82,349 were males and 75,069 females. The houses, inhabited and uninhabited, were 30,292. The area was estimated at 368,399 acres, or 576 square miles, with 272 persons to each mile. The population of the principal places or parishes was as follows:—

Abergavenny	4,797	Chepstow	4,295
Aberystruth	14,383	Christchurch	1,646
Bassaleg	2,159	Clawrplwif	2,096
Caerleon	1,281	Coleford	2,310
Ishlawrcoed	2,639	Mynyddmaen	1,519
Lydney	2,577	Newport	19,323
Llanfoist	1,453	Panteague	2,349
Llangattock	1,539	Penmain	2,379
Llanover	2,942	Risca	2,044
Llanvrechva	2,502	Trevethin, with Pontypool	16,864
Llanwenarth	2,502	Ushlawrcoed	15,424
Machen	2,210	Usk	1,479
Manmoel	9,120		
Monmouth	5,700		

MONOCEN'TRUS (Gr. *μόνος* one, and *κέντρον* spine), a genus of fishes, of the family *Percidæ*, with one large spine, showing the ventrals, in the angle of which are the true fins.

MON'OTHEISM (Gr. *μόνος* one, and *Θεός* God), the belief in or worship of one God, in opposition to *Polytheism*, or the worship of many gods. Although polytheism extensively prevailed among the greatest nations of antiquity, still we find that monotheism, or the adoration of one great Supreme, always existed, more or less, among the philosophers and statesmen of Egypt, Greece, Rome, and other distinguished nations. This doctrine was held by Pythagoras, Socrates, and Plato, and was celebrated in the Eleusinian mysteries. As to the Egyptians, where polytheism prevailed to a monstrous extent among the populace, we find that those men who were most distinguished for wisdom (as Jablonski observes) acknowledged God to be 'a certain, unbegotten, eternal Spirit, prior to all things which exist, who created, preserves, contains, pervades, and vivifies everything—who is the Spirit of the universe, but the Governor and Protector of men.' Jews and Mohammedans, and Unitarians, are strict Monotheists; and even the Trinitarians, who make the Godhead to consist of three persons, profess the same creed.

MONTAGU, BASIL, the lawyer and the scholar, was born in 1777, and was the natural son of John, fourth Earl of Sandwich, in whose house he was brought up and educated. He received the rudiments of his education at the Charterhouse, and then went to Cambridge, where he first distinguished himself by his 'Selections from our most eminent Divines and Philosophers,' a work which has since passed through several editions. On leaving the university he entered himself as a law student at Gray's Inn; and there prosecuted his studies with great avidity. He became an early admirer of Lord Bacon, and assiduously applied himself to the study and translating of his works, which he eventually laid before the world. Mr. Montagu soon rose to great eminence in that department of law which he had chosen. Lord Erskine, during his short chancellorship, gave him the appointment of Commissioner of Bankruptcy. His success at the bar was now very rapid, and he began to devote himself to the reform of the criminal law, with which his name is intimately associated. The work which he published on the subject, though ridiculed at first, eventually produced a strong impression on the public mind. The subject was taken up by such men as Romilly, Grant, and Wilberforce. When the subject was discussed in Parliament, Mr. Wilberforce said, 'Though no gentleman acknow-

ledges the source of his arguments for or against, I perceive we all speak from Mr. Montagu's book.' The result of the conflict for the mitigation of criminal punishments is now *matter of history*; and perhaps no living person would publicly advocate the old sanguinary laws of capital punishments, the mitigation of which was for years the object of Mr. Montagu's unremitting zeal. Independently of his devotion to questions of a legal and social character he applied himself to the different walks of general literature. He gave lectures at various literary and mechanic institutions; and published more than forty works, besides leaving nearly a hundred volumes of MSS. upon almost every subject connected with the intellectual and moral culture of mankind. He died at Boulogne, in 1852, aged 81.

MONTENEGRO (viii. 670) is an offshoot of the great mountain chain which bounds Albania to the north, and runs in a southern direction between the sources of the Moroka and the Narenta, and forms the boundary between the Turkish provinces of Herzegovina and Albania. The principal valleys are those of Katunzka Nahia, which is the widest and most central; the Liesanska Nahia; and the Gzerniska Nahia, a long narrow valley, which forms the southernmost district of Montenegro between the Austrian territory on the west, and Turkish Albania on the east. The central valley of Katunzka Nahia is watered by the Ricovcernovich, and contains the chief town of the territory, Cettigue, which is the residence of the Greek bishop. Mount Bukovizza is seen rising from this valley, and is about the centre of Montenegro. This district had been for ages nominally subject to the Turks, though it had never been reduced by the Ottoman troops. In 1797, however, the inhabitants threw off all subjection to Turkey, and formed an independent State under the protection of Russia. But since 1814 the Montenegrins have been nominally under the protection of Austria, to whom they have occasionally been a source of trouble, on account of their predatory incursions into the Turkish territory of Albania, and the consequent complaints of the Turkish authorities. In 1856, Danilo, Prince of Montenegro, issued a long manifesto, as an appeal to the principal European powers, in which he states that 'for four centuries and a half the Montenegrin people had sustained an incessant conflict with the Turkish empire. The blood of their heroes had moistened every rock of their lofty mountains, and had preserved to them their cherished liberty to this day. It was at the cost of their blood (says he) that the Montenegrins conquered all the coast of Cattaro, which they possessed till 1814, when the Emperor Alexander I. invited the Metropolitan and the people of Montenegro to cede the coast of Cattaro to Austria, to which power the Congress of Vienna had just awarded it. The Montenegrins submitted to the decision of the European powers, withdrew into their mountains, and abandoned the sea coast to Austria.' The prince then proceeds to state that the demands of Montenegro were limited to the recognition of its independence in diplomatic form; extension of its frontiers towards Herzegovina and Albania; a defined and settled boundary on the Turkish frontier, such as it has on the Austrian; and, finally, the annexation of the port of Antivari to the Principality.

In 1858 the feeling between the Montenegrins and Turks became more embittered in consequence of a sanguinary conflict that took place at Grahovo, which proved very disastrous to the Turkish arms. It was expected that this collision would lead to an exterminating war. But the leading powers of Europe formed a commission to investigate the affair, and determine the future position of Montenegro, and in October of the same year it was announced to the world in their favour.

MONTGOMERY, JAMES, Editor of the 'Sheffield Iris,' was born at Irvine, in Ayrshire, in 1771. His father was a Moravian missionary, whom he lost at an early age; and he had to struggle with all the difficulties with which a poor orphan has usually to contend. At a very early age his mind was devoted to the scribbling of rhymes, and he contrived to make his way to London, where he became shopman to Mr. Harrison, a bookseller in Paternoster Row. He soon returned to Yorkshire, and in 1782 obtained a situation in the establishment of Mr. Gales, a bookseller of Sheffield, who had begun a newspaper, called the 'Sheffield Register;' and when his master was obliged to fly from England, to avoid imprisonment for libel, the young poet became the editor and publisher of the paper, the name of which he changed to the 'Sheffield Iris.' In 1795 he was prosecuted by the Attorney General, and suffered three months' imprisonment for reprinting a song commemorating 'The Fall of the Bastille.' In 1796 he was again imprisoned for an account he gave of a riot in Sheffield. In the meantime he had attracted public attention by his poetical effusions. In 1797 he brought out 'Prison Amusements;' in 1805, 'The Ocean;' in 1806, 'The Wanderer in Switzerland;' in 1809, 'The West Indies;' and in 1812, 'The World before the Flood.' His reputation as a poet was now fully established. In 1819 he brought out a poem in five cantos, entitled 'Greenland;' and in 1828 appeared 'The Pelican Island.' In 1851 the whole of his works were published in one volume; and in 1853 appeared 'Original Hymns, for Public, Private, and Social Devotion.' 'In his poems,' says the 'Athenæum,' 'there was a certain harmony of numbers, an elevation of tone and sentiment, and a feeling of the picturesque in description.' In 1840 Montgomery parted with the 'Iris,' and it fell under other management. It is now extinct. A few years ago, the Queen conferred a pension upon him of 150*l.* per annum. He died at Sheffield in 1854.

MONTGOMERY, REV. ROBERT, poet and author of the 'Omnipresence of the Deity,' was born in 1808. He was the son of a celebrated theatrical clown, named Gomery. He established his fame as a poet in 1828 by the production of his first great poem, 'The Omnipresence of the Deity.' He was also the author of several minor poems; but the next work of any importance was

the one entitled 'A Universal Prayer; Death; A Vision of Heaven; and A Vision of Hell.' In 1830 he brought out the 'Puffiad, a Satire.' It was at this period that Mr. Montgomery repaired to the University of Oxford, in the hope that his poetical fame would procure preferment in the Church; but he did not there receive those honours which his ambitious mind had anticipated; although in 1833 he graduated as B.A., and in 1838 as M.A. In 1832 he published 'The Messiah,' a poem in six books, which was succeeded, in 1833, by 'Woman, the Angel of Life.' In 1835 he was ordained at St. Asaph, and appointed curate at Whittington, co. Salop. In 1838 he became minister of an Episcopal congregation at Glasgow, where he remained until 1842. He then came to London, and became minister of Percy Chapel, in the parish of St. Pancras. This year he brought out another poem, in blank verse, entitled 'Luther; or, the Spirit of the Reformation,' which, in 1845, reached a fourth edition. About this period, and subsequently, he published a great variety of minor works, not only of a poetical, but of a theological character.

Perhaps few men have been more severely criticised than Mr. Montgomery, especially in the pages of the 'Edinburgh Review,' and by Mr. Macaulay, yet few poets of modern times have been more successful. Of his 'Omnipresence of the Deity,' it is stated that at the time of his death no less than twenty-six editions had been published. He died in 1855.

MONTGOMERYSHIRE, North Wales (viii. 672-5). According to the census of 1851, the population of the county was 67,335; inhabited houses, 13,350. The area was estimated at 755 square miles, or 483,323 acres, about half of which is uncultivated, and about 80,000 acres under tillage. The population of the principal places was as follows:—

Llanfair . . .	1281	Newtown . . .	6371
Llanfyllin . . .	1116	Welshpool parl. b.	4434
Machynlleth . .	1673	——— mun. b.	6564
Montgomery . .	1248		

MONTJOYES, in the Middle age, were heaps of stones, or hillocks, sometimes called *cairns*, where saints had suffered martyrdom. These stones were laid together by pilgrims, and crosses frequently erected upon them. They were similar to the *thermulæ* of the classical ancients, which consisted of heaps of stones, placed in cross-ways, to which every traveller, in passing, added a stone.

MOODKEE, a large village of Hindustan, situated on the southern bank of the river Sutlej, near Ferozepore, celebrated as being the scene of a sanguinary conflict with the Sikhs in 1845, when Sir Robert Sale lost his life. The Sikh army had crossed the Sutlej for the invasion and plunder of India; but it was met by the British troops under the command of Sir Hugh Gough and Sir Henry Hardinge, which did not amount to more than one-fourth of the enemy's strength. A tremendous battle was fought; the Sikhs were utterly defeated, and the carnage, especially during their flight across the river, was frightful. The victory led to the final occupation and possession of the Sikh territory.

MOON (viii. 681-7). The observations lately made by Lord Ross, through his monster telescope, are of a most interesting character. They afford us information respecting the moon's surface which was certainly unknown to our ancestors. His lordship states that every object on the surface of the moon 100 feet in height is now distinctly visible; and under favourable circumstances even objects sixty feet in height. Rocks and stones innumerable are seen, but no architecture—no building, although such a single structure as Somerset House, for instance, ought to be distinctly visible—far less a street, a village, or a town. Not a vestige of green fields or of water appears, although even a small reservoir would be recognisable. The popular belief is, that the changes of the moon influence the weather; but there appears no philosophical rationale to justify such an opinion; and Professor Nichol, the astronomer royal of the Edinburgh Observatory, in a letter to a friend, who doubted the fact, thus records his opinion:—'Regarding the supposed influence of the moon on the weather, you are altogether correct. No relation exists between these two classes of phenomena. The question has been tested and decided over and over again by the discussion of long and reliable meteorological tables; nor do I know any other positive way of testing any such point. I confess I cannot at present account for the origin of the prevalent belief.'

MOORE, THOMAS, translator of 'Anacreon,' and author of the 'Irish Melodies,' was born at Dublin, in 1779. He was brought up as a Roman Catholic, and at a very early age devoted himself to the scribbling of verses. The University of Dublin having been thrown open to Roman Catholics in 1793, young Moore soon availed himself of the opportunity of gaining admission; and while still a mere boy he undertook the translation of Anacreon's Odes, which were published in 1800, and materially tended to advance his reputation as a lyric poet. In 1803 he succeeded in obtaining the friendship of the Earl of Moira, who promoted him to an official situation in Bermuda; but he was absent only fourteen months; and soon after his return he brought out two volumes of Odes and Epistles, which were so severely criticized in the 'Edinburgh Review,' that it led to a duel between Moore and Jeffreys, the editor of that periodical. In 1811 Mr. Moore formed a matrimonial alliance with Miss Bessy Dyke; and the friendship of Lords Holland and Lansdowne introduced him to many Whig families, where his brilliant talents were sure to render him a welcome guest. On his retirement to Ashbourne in Derbyshire, he applied his ready pen to a variety of subjects; as the 'Intercepted Letters, by Thomas Brown the Younger,' 'Sacred Songs,' &c. Here also he commenced his splendid oriental poem of 'Lalla Rookh,' for which Messrs. Longman gave him 3000 guineas. On its publication the work was hailed with a burst of enthusiasm, as presenting the best portraiture of oriental manners and

scenery, told in harmonious verse, that had ever been presented to the public. Of this work there have been upwards of twenty editions, and it has been translated into the Persian language. About this period, Moore took up his residence at Sloperton Cottage, near Devizes, in the neighbourhood of his patron, the Earl of Lansdowne. Here he received intelligence that his deputy at Bermudas had involved him in a debt of 6000*l.*; for which his creditors had become importunate. He received many offers of pecuniary assistance; but these he declined, under the assurance that the productions of his pen would eventually discharge all his liabilities. He now produced in succession a variety of works, both of a satirical and poetical character; among others, 'The Fudge Family in Paris,' 'Rhymes on the Road,' and 'Loves of the Angels;' the last of which had an extensive circulation. These were followed by the 'Life of Sheridan,' which appears to have disappointed public expectation. In 1827 he brought out an interesting prose tale, called 'The Epicurean,' which was dedicated to Lord John Russell. In 1830 he produced the 'Life of Lord Byron,' for which he received 2000 guineas. His next works were the 'Life of Lord Edward Fitzgerald' (1831), and the 'History of Ireland.' But of all Moore's productions, his 'Irish Melodies' will ever form the principal groundwork of his popularity as a man and a poet. Their sweetness, pathos, vivacity, and nationality of sentiment will long continue to render them the favourites of the British public.

Under the administration of the Whigs, in 1835, Moore obtained a pension of 300*l.* a year, as a well-earned tribute for the services he had rendered their cause by a variety of humorous and satirical poems. After this, it may be said, his literary exertions ceased. He almost entirely devoted himself to the socialities and amenities of private life; but unfortunately, for the last three years of his existence, he became mentally imbecile, from a gradual softening of the brain. He died in 1852.

MOORSTONE, a species of coarse granite, found in many parts of England and Scotland, but more especially in Cornwall. It is often used in the coarser parts of a building.

MORA, a species of S. American wood, the produce of the *Mora excelsa*, a very lofty tree of about 100 feet in height. The trunk, when of the height of forty to fifty feet, will square from eighteen to twenty inches. The wood is tough, close, and cross-grained, and peculiarly calculated for ships' timbers and planks, for which purpose it is extensively used. The bark is applied to tanning purposes. In times of scarcity the seeds, which contain starch, are used by the Indians as food.

MORASS (Swed. *moras*, or Dut. *moeras*), a marsh, bog, or fen, generally existing in low moist ground, and formed by a surface of peat moss or vegetable matter spread over extensive areas in northern latitudes. Morasses are usually found to yield and quiver to the tread, which arises from the slight consistency of the aqueous substratum. In Ireland these morasses are sometimes known as moving bogs; and in Scotland they are called quaking mosses. On the confines of England and Scotland there is a dangerous morass, called the Solway Moss, which is described by Gilpin as a flat area about seven miles in circumference; and being covered with grass and rushes presents a dry crust and fair appearance, but shakes under the least pressure, the sub-stratum being semi-fluid. At the battle of Solway, in 1542, when the Scotch army was routed, a troup of flying horse plunged into this morass, which instantly closed upon them. On the north-western coast of England, between Walsall and the mouth of the Ribble, there is an extensive morass, which for miles is intersected with broad and deep ditches for the purpose of draining the superincumbent peat. The bottom of these ditches consists of a mere black sludge, which sometimes proves fatal to the cattle grazing on the moss; but the surface peat, from the continual aggregations of vegetable matter, is every year becoming thicker and harder.

MORDEL'LIDÆ (Lat. *mordeo* to bite), a family of Coleopterous insects, of which the genus *Mordella* is the type, so called from the tenacious and sharp bite it inflicts.

MORINGA'CEÆ, in botany, a natural order of Exogens, belonging to the Violales of Lindley, of which the Malabar name *Moringa* is the type. The leaves are pinnated, the flowers white and irregular, and the fruit a long podlike capsule.

MORISCO, or MORRIS DANCE, a peculiar kind of dance, of Moorish origin, which came into use in England in the reign of Henry VII.; and in the time of Henry VIII. was held in considerable repute at all parochial festivals. In the earliest Morisco dance, it was the custom for a boy, when supper was finished, to enter the hall with his face blackened, his forehead bound with white or yellow taffeta, and bells tied to his legs. He then proceeded to dance the Morisco backwards and forwards. In more recent times the dance consisted in striking the ground with the fore-part of the feet or the heels, while the dancer contrived to rattle his bells with sonorous effect. The great art was to move the feet so as to produce a musical concord from the various bells.

MORMONS (or 'LATTER-DAY SAINTS'), a sect of religionists, whose principal settlement is in Utah, a territory of the Great Salt Lake in North America. This settlement was formed in 1847, after the expulsion of the sect from Nauvoo, in the State of Illinois. Their great leader and prophet was murdered by an armed mob in the gaol of Carthage, United States; when his brother shared the same fate. In the same year Brigham Young became Smith's successor; and under his guidance the sect migrated from Nauvoo to the Great Salt Lake, beyond the Rocky Mountains. Here they founded the city of Utah. In 1849, at a convention of the citizens of Upper California, a Constitution was adopted, which was afterwards ratified by Congress; and eventually the command of the new settlement was vested in Brigham Young.

From an official statement published by the

government of the United States, it appears that the Mormons have about ninety-five missionaries in Europe, and an equal number in Asia, Africa, and the Pacific Islands, besides large numbers of native elders in the various fields of labour, and a considerable number scattered throughout the United States and British America. They have one newspaper in Salt Lake City, issuing 4000 copies weekly; one in Liverpool issuing 22,000 weekly; one in Swansea, South Wales; one in Copenhagen, in the Danish language; one in Australia; one in India; and one in Switzerland, in the French language.

The members of this sect pretend that their doctrines are founded on the 'Book of Mormon,' which had been mysteriously brought to light, and that its contents are the result of inspiration. But the truth is, the 'Book of Mormon' was a novel, written by an American clergyman, of the name of Solomon Spaulding. In 1812 Spaulding put it into the hands of a printer named Lamdin, at Spittsburg, Pensylvania; but, Spaulding dying shortly after, the printer retained possession, and lent the manuscript to Sidney Rigdon, with whom Joseph Smith, the founder of Mormonism, was concerned; and in 1830 the work came out to the world in its present form. It has been translated into various languages.

A history of the Mormons has been lately published in Germany, from which it appears that America contains 68,000 of that sect, of whom 38,000 are in Utah. Europe contains 39,000, of whom 32,000 are in Great Britain and Ireland, 5000 in Scandinavia, 1000 in Germany and Switzerland, 500 in France, and 500 in the rest of Europe. In Asia there are said to be 1000, in Australia and Polynesia 2400, in Africa 100, on travel 1800. There are, besides, 8500 schismatics, including Strangites, Rigdonites, and Wightites.

Polygamy appears to be one of the hideous features of this sect; and many of the principal 'Saints,' as they are called, have a number of wives. This great social abuse, in addition to some overt acts of rebellion against the United States' officials, induced the House of Representatives, in 1857, to declare the territory of Utah to be in open rebellion, and to direct an expedition to be undertaken against the Mormons; but the troops suffered so much from the length and dreariness of the journey, that the cattle, as well as men, perished in great numbers, before they reached the territory of Utah; and hence the misunderstanding was eventually settled without the employment of force.

MORRISON, MAJOR-GENERAL SIR WILLIAM, an officer of the Madras artillery, who acquired distinction by his formation and admirable superintendence of the Madras commissariat, especially during the Burmese war of 1824–5, from which he retired with great *éclât* in 1828, being then a lieutenant-colonel. He afterwards became commissioner of the Mysore district. In 1833, on the renewal of the East India Company's charter, he had the honour of being appointed a military member of the Supreme Council of Bengal, which office he held for three or four years during Lord William Bentinck's administration. On his return to his native country he was elected Member of Parliament for Clackmannan and Kinross. He died in 1851.

MORTALITY (viii. 723–6). The public health of the metropolis, within the last few years, owing to the sanitary measures of the authorities, has wonderfully improved. Instead of being twenty-five to a thousand, according to the average of years, the deaths may be estimated at twenty-one or twenty-two. In the northern and western divisions of London, the mortality has ranged at twenty-one; while in the eastern, it has been at twenty-three in a thousand. It has also been demonstrated that in the provinces, where sanitary measures have been adopted, the decrease in mortality has been much more decided than in the metropolis. For instance, at Macclesfield, in one of the streets the decrease has been 60 per cent.; in a second, 42 per cent.; in a third, 40 per cent.; in a fourth, 34 per cent.; and in a fifth, 12 per cent. The street in which the decrease was the greatest was the first to be improved, and that in which there was the least decrease was the last executed, showing that the longer the works have been in operation the greater the decrease.

The following may be considered as the usual average of the proportions of life and death in various parts of the world. In Turkey the deaths are to the population as 1 in 30; in Prussia, 1 in 39; in Portugal, Spain, Switzerland, and Austria, 1 in 40; in Norway and Sweden, 1 in 41; in France, 1 in 42; in Belgium, 1 in 43; in Russia (Europe), 1 in 44; in Denmark, 1 in 45; in England, 1 in 46; in the United States, 1 in 74; in Canada, 1 in 97; in Canada (Upper), 1 in 102; in Canada (Lower), 1 in 92.

MORTIER, MARSHAL, DUC DE TREVISO, one of Napoleon's most distinguished generals, was born in 1768. He was the son of a merchant who represented the *tiers état* of Cambresis at the States-general in 1789. He was originally intended for the mercantile profession; but in 1791 he entered the army with rank of captain, and having highly distinguished himself on many occasions, during the revolutionary wars, he rose to the rank of general of division. He was actively employed with the armies of the North, the Sambre, and Meuse, and the Rhine. In 1801 he was in sole command of the seventeenth division of the army of Hanover. Created a marshal of the empire, in May 1804, he served with great distinction with the grand army, then in Spain, and again with the grand army of France. Napoleon created him Duc de Treviso. After the departure of Napoleon for the island of Elba, he joined the Bourbons, and held many appointments of importance under the Restoration. In 1831, after the accession of Louis-Philippe, he was grand chancellor of the legion of honour; and in 1834–5 minister of war, and president of the council. He was also chevalier of the order of St. Esprit, and bore several foreign orders. Being among the staff that accompanied Louis-Philippe and princes to the review at Paris, on the 28th of July, 1835, this brave officer lost his life by the explosion of Fieschi's infernal machine.

MORTUARY (Lat. *mortuaria* funeral rites), in the Middle age, a kind of ecclesiastical heriot, or custom, which extensively prevailed, of leaving goods or other property to the church, as a recompense for offerings or personal tithes not duly paid in the lifetime of the dying penitent. These heriots, like lay-heriots, appear, in the first place, to have been only voluntary bequests, until at length the custom became established as a right. Thus from the property of the deceased, the lord's heriot or best chattel was taken, and then the second best reserved to the church as a mortuary. In the laws of king Canute it is called *soul-scot*. To such an extent did this practice prevail during the plenitude of papal power, that in the thirteenth century ladies were in the habit of giving their beds, completely furnished, to the church in which they were buried; and their husbands, in the same manner, gave their arms, horse, or other warlike accoutrements. Ecclesiastics demanding these gifts as a right, their assumption frequently extended to the fee simple of land, when the lord would give his fee to a religious house, so as to take it back again, and hold it of that body; or otherwise he would bequeath it in perpetuity, to the prejudice of his heirs. But at length the statute of *mortmain* (passed 9 H. III. c. 36, and amended by various subsequent Acts,) declared that any such gift to a religious house was to be null and void, and the land to be forfeited to the lord of the fee. [MORTMAIN.]

MOSAIC (viii. 732–3). There is a species of Mosaic work of comparatively modern invention, made of a kind of gypsum or talc, which is calcined in a kiln, beaten in a mortar, and sifted. From this material artificial marbles are formed, which are made to imitate precious stones; and from these a Mosaic work is composed, which is little inferior, in lustre and durability, to the natural stones.

The Mosaic of marble or porcelain is at present most in use, and serves for the pavement of public halls, palaces, and churches. But the Mosaic work, so much admired in St. Peter's at Rome, is executed with coloured glass. The small pieces of this material are arranged with so much accuracy, and the light and shade so well observed, that they appear as smooth as marble, and as highly finished as a painting in fresco, with this advantage, that the glass retains its lustre for ever, while mere paintings soon lose their freshness or brilliancy. The pieces of glass are laid on a kind of plaster, composed of lime, fine brick-dust, gum tragacanth, white of eggs, and other ingredients.

MOSAIC GOLD, a metallic substance, extensively used in the arts. It consists of an alloy of equal proportions of copper and zinc. It is also a bi-sulphuret of tin imported from Germany, under the name of bronze powder, which is used for ornamental work, especially for printing and paper-hangings. [AURUM MUSIVUM, *Suppl.*]

MOSCOW (viii. 737–9). The census taken by the Russian government in 1847 gives the population of the city of Moscow at 353,259. When Napoleon entered the city, in 1812, there were 350,000 inhabitants, 300 churches, and 10,000 houses; so that the increase of inhabitants since that period has been comparatively slow. The population of the province, of which Moscow is the chief city, is 1,506,953; and the area contains 8,018,649 English acres of land, with a public revenue of 9,551,757 silver roubles.

MOTES, among our Anglo-Saxon ancestors, were public courts of justice, or general meetings of the people, assembled for legislative or municipal objects. These courts are often mentioned in our English history, under different names; as the *Burgemote* (meeting of the burghers); *Folcmote* (meeting of the people); *Hallgemote* (the hall meeting); *Hundredgemote* (meeting of the hundred); *Shiregemote* (a county meeting); *Wardegemote* (a ward meeting); *Wittenagemote* (a meeting of the Wiseacres, or great national council). The *Mote-bell* was the bell used by the Saxons to summon the people together at the motes.

MOT'-MOT, a beautiful South-American bird, of the order *Passerinæ*. It approaches to the size of a magpie, with lax feathers on the head, as in the jay, and a long graduated tail, the two middle feathers of which are destitute of vanes for about an inch from the extremity. These birds fly badly, and are very shy. Their usual places of resort are the solitudes of the forest; where they nestle in holes, feed on insects, and build their nests in the ground.

MOUNTAINS, those bold excrescences of the earth's surface, which form the most imposing aspects of nature; being to the eye of the painter the most picturesque, and to the mind of the geologist the most interesting of all natural objects. They appear under the various forms of gentle slopes, bold hills, and majestic eminences which soar above the clouds, and appear to claim a sovereign authority over all the surrounding country where they are situated. The general arrangement of mountains is in chains, ridges, or lofty prominences. The most elevated points of a great chain are usually about the middle; as Mont Blanc in the Alps, and Chimborazo in the Andes. The first-class chains of mountains have almost uniformly a gentle declivity on the one side, and an abrupt descent on the other. These characteristics are peculiarly exemplified in the Ghauts of India, the Alps, the Pyrenees, the Andes, and the mountains of Scandinavia. Chains near the coast have their steepest sides fronting the ocean. Thus the range of the Andes presents its most craggy and precipitous faces to the Pacific, and the Taurus, Atlas, and Lebanon, to the Mediterranean. The largest mountain ranges in the world generally follow the direction in which the land of the continents where they are situated has its greatest extent. Thus the Andes of South America traverse the new world in the direction of its principal length. In the same manner the Ghauts in Hindustan, the Appennines in Italy, and the Dodrafeld in Sweden and Norway, follow the general direction of these peninsulas. The following is a list of the principal chains of mountains, with their lengths computed in miles:—

	Miles.
Andes, South America . .	4,500
Rocky Mountains, North America	3,000

	Miles.
Himalaya, including Hindoo Kosh, &c.	2,800
Atlas, North Africa	2,000
Kouenlun, Thibet	1,600
Ural, boundary line between Asia and Europe	1,500
Alleghanies, United States	900
Scandinavian chain	900
Altai, South boundary of Siberia	884
Appennines	800
Caucasus, from the Caspian to the Black Sea	700
Alps	450
Pyrenees	200

Isolated mountains, appearing apart from any chain or group, are either active or extinct volcanoes; as Mounts Etna and Vesuvius, the Peak of Teneriffe, Mount Egmont in New Zealand, and a few others; the loftiest mountains, as the Dhwalagiri of the Himalaya, Ararat in Armenia, Nevada di Sorata of the Andes, Mont Blanc, &c., being vast excrescences of mountain chains, ranging from 15,000 to 28,000 feet in height. The loftiest mountains on the surface of the globe consist of masses of granite (the primary formation of the earth's crust), and present the most rugged and broken aspects, with very precipitous sides; while those of gneiss and mica slate are not so wild and irregular. The mountains composed of secondary formations—lime stone, sand stone, and greywacke—are of inferior elevation, compared with the granite and gneiss mountains, and the declivities are not so wild and precipitous. Humboldt directs attention to the striking difference between the mountains of the eastern and western continents. The Himalaya, Mont Blanc, and others of the higher Alps, soar with their granite heads far above the clouds, and form the loftiest points of the old world; while in the transatlantic hemisphere the freshest whinstone, or floetz trap, which in Europe appears only in low mountains, form the loftiest summits of the mighty Andes. Chimborazo and Antisana are covered with vast walls of porphyry, which rise to the height of six or seven thousand feet. Other secondary formations, such as sand and limestone, are also formed at greater heights in the western hemisphere of the globe than in the old regions of the east.

The highest mountains in the world are undoubtedly those of the vast Himalaya range, on the southern confines of Tartary, and the north of Hindustan; but which was the highest mountain has long been a subject of dispute. If, however, we are to rely on Herr Herman Schlagintweit, the point is now settled. In 1855 he left Calcutta, and set out for the north-western provinces of Bengal. Having reached Sikkim, he continued his researches all along the Himalaya with a view of ascertaining their heights, as well as their peculiar characteristics, until he reached the loftiest eminence of Nepaul. This, our traveller states, is the highest mountain in the world at present known, being considerably over 29,000 feet above the level of the sea. The natives have two names for it—one of them *Gorishanta*, which is mythological, and is to be found only in the Nepaulese; and the second name, *Chingofanmara*, is that by which it is known among the people of Thibet.

The following is a list of some of the highest mountains in the world, the lowest of which exceeds 10,000 feet, or more than two miles in height.

	Feet.
Gorishanta, or Chingofanmara, Himalaya	29,000
Dhwalgiri, ditto	28,000
Javahar, ditto	25,746
Nevada di Sorata, Andes	25,400
Nevada d'Illimani, ditto	24,450
Chimborazo, ditto	21,425
Antisana, ditto	19,136
Cotopaxi, ditto	18,867
Popocacepeti, Mexico	17,720
Mount St. Elias, California	17,863
Ararat, Armenia	17,260
Elbürz, Georgia	16,700
Mont Blanc, Alps	15,570
Mont Rosa, ditto	15,150
Geesh, Abyssinia	15,000
Peak of Dimavend, Persia	14,300
Kasebeck, Georgia	14,400
Finster-aar-Horn	14,109
Ophir, Sumatra	13,840
Jungfrau, Alps	13,716
Ortler Spitz	12,852
Peak of Teneriffe	12,180
Mulhacen, Grenada, in Spain	11,678
Egmont, New Zealand	11,430
Miltsin, Barbary	11,400
Nethou, Pyrenees	11,427
Perdu, ditto	11,275
Biclonka, Altai range, Tartary	11,063
Etna, Sicily	10,873

What is usually called *the snow-line*, or the height at which there is perpetual snow on the loftiest mountains, is an object of great interest, as showing the reduced temperature which prevails at a given height. Of course the elevation of this snow-line differs in proportion to the latitude and the season of the year. Thus under the equator, in South America, it attains an elevation equal to that of the summit of Mont Blanc, and descends about 1023 feet lower towards the northern tropic in the elevated plateaux of Mexico (lat. 19° N.). It is stated by Dr. Gillies, that on the declivity of the volcano of Peuquênes (lat. 33° S.) he found the snow-line at an elevation of about 15,000 feet. In the expedition of the Beagle, the snow-line of the volcano of Aconcagua, N.E. of Valparaiso (lat. 32° 30′ S.) was found to be more than 1400 feet higher than Chimborazo. In an almost equal degree of northern latitude, from 30° 45′ to 31°, the snow-line, on the southern declivity of the Himalaya, lies at the elevation of nearly 13,000 feet. On the northern declivity, however, the snow-line is situated at a height of 16,630 feet, and this may be accounted for by its being under the influence of the high lands of Thibet, which range at about 11,510 feet.

MUCIV'ORA (Lat. *mucus* slime, and *voro* to devour), a family of Dipterous insects, which feed

on mucus, or juices of decomposing animal or vegetable bodies.

MUDGE, WILLIAM, LL.D., F.R.S., and a major-general in the army, was the son of General Mudge, lieutenant-governor of the Royal Military Academy at Woolwich, and born in 1789. He entered the army in 1807, and served for some time in the Peninsula, when he eventually became a lieutenant-colonel in the Royal Engineers. It is deserving of notice that he was the third in family succession of the directors of the series of geodetical operations connected with the trigonometrical survey of Great Britain and Ireland, the production of the Ordnance maps, and the measurement of the English arc of the Meridian. For some years he was entrusted with the important charge of the drawing department of the Tower of London, where the Ordnance maps were constructed. He died at Teignmouth, co. Devon, in 1854.

MUGIL'LIDÆ, the Mullets, a family of Acanthopterygious fishes, with long cylindrical bodies and short snouts, and dorsal fins remote.

MUL'LICITE, a mineral of a bluish-black and opaque colour, with a vitreous lustre, found at *Mullica*-hill, New Jersey, whence its name. It occurs in cylinders of about two inches long. Its constituents are phosphoric acid, protoxide of iron, grains of quartz, and water.

MUL'LIDÆ, the Surmullets, a genus of Acanthopterygious fishes, of an ovate shape, and large head, and the caudal fin forked.

MUNSTER (viii. 789). According to the census of 1851, the population of the province was 1,827,244; and the area 6,064,579 acres. The population of the different counties is given under their respective heads.

MURAGE (Lat. *murus* a wall), in the Middle age, a toll levied for the reparation of the public walls, on every cart or horse passing through a town or city. The right was either by grant or prescription. In building or repairing the walls of a city or castle, the services of the inhabitants, or neighbouring tenants, were called upon; and when this personal duty was commuted into money, the tax collected was called *murage*. (Kennet's *Par. Antiq.*)

MUREX (Lat. *murex* a shell fish, or dye of the fish), a genus of carnivorous gasteropods, of the family *Muricidæ*, or Whelks, the shells of which consist of one spiral valve, rough, with membraneous furrows; and the aperture terminates in an entire canal, either straight or somewhat ascending. The varices are from three to five in each whorl. It is from a species of murex, on the coasts of Guatemala and Guayaquil, that a dye is extracted, which imparts to silks, woollens, and cottons, a beautiful purple colour, of a permanent character. The shell is described as being of the size of a walnut, and adhering to the rocks which are washed by the sea. The method of extracting this dye is by drawing the fish partly out of the shell, and then squeezing it, to make it yield the fluid which serves for dyeing. No colour at present known, says the Abbé Raynal, can be compared with it, either as to richness, lustre, or permanency. But it is evident that this valuable dye was well known to the ancients; and that the *murex* abounded on the coasts of Tyre and Sidon; hence the purple of the ancients is often called Sidonian, Phœnician, or Tyrian dye. Pliny states that the murexes, when dying, ejected a quantity of this precious liquid, and that the sailors, on this account, were always anxious to catch them alive.

MUSETTE, in music, the name of a soft and sweet air, generally written in common time. It was also the name given to a kind of bagpipe, formerly used in most countries of Europe, the performers on which were called *Musais*. These musais were itinerant musicians, once very numerous in different parts of Europe.

MUSEUM, BRITISH (iii. 830–35). This great national establishment has undergone some material improvements, especially in the enlargement of library accommodations. For some years past the utter insufficiency of the institution for book room, and accommodation for the numerous readers, had become more and more apparent, until at length it was determined to erect a new reading-room on the site of the inner quadrangle of the building. It occupied three years in the erection, and incurred an outlay of 150,000*l*. Mr. Smirke was the architect. It was opened in the summer of 1857 for the inspection of the public, and afterwards devoted to the exclusive use of readers, students, editors, and authors. Its form is circular, of vast proportions, and magnificent appearance. The dome is 106 feet in height, and 140 in diameter, two feet less than that of the Pantheon at Rome, but one foot more than that of the dome of St. Peter's. The building is mainly of iron; 2000 tons having been employed in its construction. There is convenient accommodation for 300 readers, with ample means for warming and ventilation. About 80,000 volumes are now ranged on the shelves of the reading room. There are three miles of bookcases eight feet high. From an authorized description of the building the following particulars are gleaned.—The reading room contains ample and comfortable accommodation. Each person has allotted to him a space of four feet three inches long. He is screened from the opposite occupant by a longitudinal division, which is fitted with a hinged desk graduated on sloping racks, and a folding shelf for spare books. In the space between the two, which is recessed, an inkstand is fixed, having suitable penholders. The Catalogue tables, with shelves under, and air-distributing tubes between, are ranged in two concentric circles around the central superintendent's enclosure, or raised platform, the latter being fitted with tables, ticket boxes, and dwarf partitions surmounted by glass screens, dividing a passage leading to the surrounding libraries. The pedestals of the tables form tubes communicating with the air-chamber below, which is six feet high, and occupies the whole area of the reading room. It is fitted with hot-water pipes arranged in radiating lines. The supply of fresh air is obtained from a shaft, built on the north side of the north wing about 300 feet distant,

communicating with a tunnel or tube-way, which has branches or loop lines fitted with valves for diverting the current either wholly through the heating apparatus, or through the cold-air flues, or partly through either, as occasion may require. The air channels are of sufficient capacity to admit a supply of fresh air for 500 persons at the rate of ten cubic feet per minute, and at a velocity not exceeding ten feet per second. For summer ventilation steam-pipes, placed at the summit of the roofs and dome, are heated, and extract the foul air when the external and internal temperature is unfavourable for the purpose. In the decoration of the interior dome, light colours and the purest gilding have been preferred. The inner surface of the dome is divided into twenty compartments by moulded ribs, which are gilded with leaf prepared from unalloyed gold, the soffites being in ornamental patterns, and the edges touching the adjoining margins fringed with a leaf-pattern scolloped edge. Each compartment contains a circular-headed window, twenty-seven feet high, and twelve feet wide, with three panels above, the central one being medallion-shaped, the whole bordered with gilt mouldings and lines, and the field of the panels finished in encaustic, azure blue, the surrounding margins being of a warm cream colour. The cornice from which the dome springs, is massive, and almost wholly gilded. Between the cornice and the floor, the space is filled with the bookcases and galleries of access, the cornice, standards, and railings of which are gilded; thus presenting, on the whole, a magnificent and pleasing *tout ensemble*.

It is deserving of record, that a century ago only *five* readers attended the public reading room in the course of one month (July 1759); whilst, according to the parliamentary return for the year ending the 24th of December, 1856, the number of readers within the year was 53,309, or an average of 181 per day; the reading room having been kept open 293 days. The number of volumes is upwards of half a million. The increase has been enormous. According to the official return just mentioned, the annual additions amount to 10,434 volumes, including music, maps, and newspapers, of which 753 were presented, 4010 purchased, and 5831 acquired by home copyright. The number of parts of volumes was 27,516. In addition, the library had accumulated numerous maps, charts, and plans, variously obtained. The number of pieces of music alone added was 2347. In gross, the total additional articles that year numbered 42,639. Of the complete works accumulated in the twelve months, 1901 were presented, 2005 purchased, and 7933 were acquired under the copyright acts.

The sums expended on the general collections of the British Museum have been on a liberal scale. The total sum paid for purchases and new acquisitions, in the year ending March 31, 1858, was 16,919*l.* 9*s.* Of this 6845*l.* 14*s.* 7*d.* was expended on printed books, 2481*l.* 6*s.* on MSS., 691*l.* 15*s.* on fossils, 1623*l.* 16*s.* 8*d.* on zoological specimens, 2975*l.* 4*s.* on coins and antiquities, and 1200*l.* 0*s.* 4*d.* on prints and drawings. The estimate for printed books this year (1858) exceeds the expenditure of the previous year by 3000*l.*; for fossils, by only 100*l.*; for prints and drawings, by 800*l.*; for binding printed books, by 4500*l.*; for binding MSS., by 200*l.*; for repairing and fixing antiquities, by 1500*l.*

MUSEUMS. Besides the British Museum, there are several others, which, though of minor importance, possess many interesting features. Among others may be mentioned the *South Kensington Museum*, opened in June 1857, for the exhibition of works of art, science, literature, and manufacturing industry. It appears to have been highly patronized; and from the time of its opening to the following April, there were 418,951 visitors. The highest average is on a Monday night, when the admission is gratuitous, and upwards of 2700 persons usually attend.

Here it may be mentioned that upwards of thirty years ago, M. Von. Kees, then chief inspector of factories in the Austrian empire, formed a large collection of the raw produce and manufactured articles used in Austria. There were upwards of 12,000 specimens, and the descriptive catalogue extends over 2300 pages, with the prices of many of the articles annexed.

Among other interesting collections of works of science, art, and antiquities with which this great metropolis abounds, independently of the Sydenham Exhibition [CRYSTAL PALACE], may be mentioned those of Marlborough House in Pall Mall, which is very numerously attended. In 1855 the number of visitors was 78,427; and in 1856 111,768; and since then they have considerably increased. There are likewise the Museum of Economic Geology; the Museum of Botany and Vegetable Products at Kew; the East India Company's Museum in Leadenhall Street; Sir John Soane's Museum in Lincoln's Inn Square; the National Gallery at Charing Cross; the Royal Historical Portrait Gallery; the Museum of Practical Geology; the Museum of the College of Surgeons, &c. Throughout the United Kingdom there are a vast number of Medical Museums, with extensive libraries. According to a recent parliamentary return, it appears that the library of the Royal College of Physicians, London, contains 13,000 volumes. The Museum of John Hunter, at the Royal College of Surgeons, contains 10,000 specimens; and the library of the college has between 40,000 and 50,000 volumes. The museum of the University of Durham contains 2547 specimens, the library 900 volumes. The Hunterian Museum, in the University of Glasgow, comprises 3735 catalogued specimens. In the Royal College of Physicians of Edinburgh there is a library containing 10,000 volumes, and a museum comprising 2740 specimens. The College of Surgeons of Edinburgh has a museum of 6356 specimens; and the Faculty of Physicians and Surgeons of Glasgow a library of 10,000 volumes. The Royal College of Surgeons, Ireland, has a museum of 5016 specimens, and a library of 12,742 volumes. The museum of Queen's College, Cork, contains 4375 specimens, and a library of 1001 volumes. The Queen's College, Galway, has a museum of 1807 specimens.

MUSIC-TYPE, a name given to the separate metal types, which are so arranged as to produce the most complicated pieces of music by the mechanical process of letter-press printing, instead of the usual plan of engraving on zinc plates. The advantage of these metal types, after they are once set up by the compositor, is the rapidity and cheapness with which a large impression can be produced. There is also the great convenience of being able to incorporate musical passages with the letter-press, which the old zinc-plate process prevents. These detached types are very numerous; for not only must the proper musical symbols be given, but the five lines of the staff or stave must be preserved; and the type-founder has to calculate how many combinations of form in the types will meet all the requirements of modern music. 'Sometimes,' says the author of 'Novelties and Inventions,' 'a type consists of the eighth of an inch of staff, with a crotchet or a quaver attached; sometimes it is a minim rest, with two bits of staff above and below it; sometimes it is a thick double line for a semi-quaver, ready to be fitted on to any note either above or below it; sometimes two notes, with an interval of a musical third between them, are formed on the same type, with fragments of horizontal lines either through them or betweeen them, so as to adapt them to take a position either on the lines or the spaces of the staff.' The whole process of placing these types together requires a considerable degree of patient manipulation on the part of the compositor.

MUSICAL GLASSES, common drinking glasses, so tuned as regards each other that on a wet finger being passed round the brims they produce all the notes of the diatonic scale, and are capable of yielding the successive sounds of regular melodies or tunes. The first person who thought of producing tunes from tones of glasses was Mr. Pickering of Ireland. Dr. Franklin improved upon the hint, and formed of glasses a very melodious instrument, which he called *an Armonica*. The largest glass in this instrument was tuned to G, one octave lower than the treble-clef note, and the highest to G in altissimo; the whole comprehending three octaves. The instrument was capable of producing, at pleasure, the sweetest and most sonorous notes, from pianissimo to fortissimo. (Busby.)

MUSKETRY, (Fr. *mousquet*, a soldier's hand-gun), muskets in general, or the art of using firelocks with skill and effect in military operations. The introduction of the percussion cap, the rifle, and the Minié ball into the service of the army, has converted the art of musketry into a perfect science, and its destructive agency has been fully demonstrated in our late contests with the Russians, the Chinese, and the Hindoo rebels. [MINIE RIFLE, *Supplt.*] The government of this country has become fully alive to the great advantages of this branch of the military service, and have therefore established a school of musketry at Hythe, in Kent, which consists of a lieutenant-colonel commandant, three captain instructors, one lieutenant instructor, one sergeant-major, one quarter-master sergeant, five sergeant instructors, twelve privates as fatigue men, and one armourer. The first object of the school was to create a permanent corps of instructors of musketry; and at the present time each regiment and depôt in the country is supplied with musketry instructors trained at Hythe; a royal warrant having been issued on the 8th of April, 1856, appointing district inspectors to supervise the instructors. Thus, after many years' anxious experiment, the British soldier, having a weapon placed in his hand perhaps superior to that of any other nation in the world, has the means of learning how to employ it with the most advantageous effect. The experiments which have been, and are now making, prove most satisfactorily the value of the new practice. The results show that in 1714 rounds fired, 1098 hit a 6-feet target, about the height of a column of infantry, at 200 yards; and out of 1790 rounds fired at 400 yards, not less than 822 hit the target, in the shorter range being 64, and in the larger 45 per cent. The results of the trial with the old 'Brown Bess' and the new rifle showed, in the strongest manner, the great superiority of the new over the old weapon. The best shot in the establishment was selected to fire with the old musket from a rest 300 yards distant from an 18 feet square target; but he only struck the target once in 20 times, while with the new rifle a target of the same size will hardly ever be missed by a good shot at 800 or 1000 yards' distance. On one occasion the target was struck 96 times out of 100 successive shots at this longer distance. There is one other most valuable purpose to which the establishment at Hythe is devoted, and that is, it affords the means of testing and reporting upon the value of those numerous inventions and improvements in fire-arms which are constantly brought under the notice of the government by ingenious inventors. A number of breech-loading rifles and carbines have been tried and reported on. The application of this principle to cavalry carbines appears to be regarded with favour; and, as an instance of the rapidity with which they may be loaded and discharged, twenty rounds were fired in two minutes and twenty seconds by Green's breech-loading carbine.

MY'ADÆ (Gr. *μυών* a muscle), a family of Mollusca, of which *Mya* (a muscle) is the genus. They consist of gaping bivalves ventricosed, ovate, and transverse; the valves more or less open at one or both extremities.

MYOCHAM'IDÆ, a family of Mollusca, of which the *Myochama* is the type. The shell is smooth, irregular, and attached by the lower valve.

MYRIAP'ODÆ (G. *μυρίος* a thousand, and *πόδες* feet), in zoology, an order of invertebrate animals, of the class *Articulata*. The Centipede is one of the species which may be said to represent this order of Annulose forms. But there are a great variety of genera and species which have been diffusely illustrated by Mr. George Newport, in the 'Linnæan Transactions,' vol. xix.

MYR'MICA (Gr. *μύρμηξ* the ant), a genus of aculeate Hymenopterous insects, of the family Heterogyna, formed out of the Linnæan genus *Formica*, but possessing a sting. The common British species is the *M. rubra*.

MYROB'ALONS, the commercial name given to the dried wrinkled fruit of different species of *Terminalia*, which are extensively imported from India for the use of dyers and tanners. The average annual imports into the United Kingdom have been estimated at 1200 tons. (Simmond's *Dict. of Trade Products.*)

N.

NÆ'NIA, in Roman antiquity, a funeral dirge sung to the music of flutes, by women hired on purpose, called *Præficæ*, who were in the habit of assuming doleful countenances, and striking their breasts, as if they, or those they represented, were deeply affected at the loss of a departed friend. Nænia was also the name of the Roman goddess who presided over funerals, and usually had a temple outside the gates.

NAIRNSHIRE, Scotland (viii. 845). According to the census of 1851, the population was 9956; and the area of the country contained 137,500 acres. The population of the municipal borough of Nairn was 3401; and that of the parliamentary borough, 2977.

NAIS (Gr. Ναΐας a Naiad), a genus of red-blooded worms, which, when mutilated, have the remarkable power of reproducing the injured parts, and also of procreating their species by spontaneous separation of the hinder segments of the body.

NAMES OF PERSONS. The application of names to different individuals is coeval with the earliest history of the human race. They are peculiar to every nation, and have always been considered as a part of the language of the people where personal names were in use. Most of them are intelligible, where the national language has been transmitted to modern times; but, owing to the gradual disuse of the words from which the names were originally derived, there are many that cannot now be understood. Among the Hebrews personal names were usually commemorative of some remarkable incident or circumstance attending the family at the time of birth; thus Cain (meaning *gotten* or *acquired*) was so called from the exclamation of Eve, 'I have *gotten* a man from the Lord.' In a similar way were derived the names of the patriarchs of the twelve tribes of Israel. The Greeks had always a distinctive meaning in their appellatives, as Pericles (the renowned), Aristotle (good success), and Demosthenes (the strength of the people). Anacharsis, the celebrated Scythian philosopher, who has been ranked among the seven wise men of Greece, has left us a very elaborate treatise on the origin and meaning of many of those names which are constantly occurring in Grecian history. 'There are some,' says he, 'that derive their origin from certain relations which have been imagined between such a man and such an animal; as, for instance, Leon, a lion; Lycos, a wolf, &c.—There are also some that appear to have originated from the colour of the complexion; as Argos, the white; Melas, the black; Xanthos, the fair; Pyrrhos, the red; and others from the name of a divinity, with a slight inflexion; as Apollonios, from Apollo; Athenæus, from Athene, &c. When parents conceived that they had obtained a child which was the hope of the family, they adopted the name of some protecting divinity, with the word *doron*, or gift, added thereto; as Theodorus, or Diodorus, a divine gift; Heliodorus, &c. Some families assumed to be descended from the gods; and hence the names Theogenes, or Theagenes, born of the gods; Diogenes, born of Jupiter; Hermogenes, born of Mercury, &c. The greater part of the names found in Homer are marks of distinction. They were given in honour of the qualities most esteemed in the heroic ages; as valour, strength, swiftness, prudence, and other virtues. From the word *polemos*, which signifies war, have been formed, Tlepolemus, that is, able to support the labours of war; and Archeptolemus, or able to direct the labours of war. By adding to the word *mache*, or battle, certain prepositions and different parts of speech, which may modify the sense in a manner always honourable, are composed the names Amphimachus, Antimachus, Promachus, Telemachus,' &c.

The Romans, in their early history, had but one name, as Romulus, Remus, &c.; or two, as Numa Pompilius. Afterwards, when they became divided into numerous clans and families, they used three names, the *prænomen*, the *nomen*, and the *cognomen*. The prænomen marked the individual, like our Christian name, as Marcus; the nomen, the gens, or clan, as Tullius; and the cognomen, the family, as Cicero. Thus we have Marcus Tullius Cicero, or C. Julius Cæsar. To these three names sometimes was added a fourth, which was called the *agnomen*, from some illustrious deed; thus Publius Cornelius Scipio was surnamed Africanus, from his conquest of Africa. Foreigners bore the nomen and prænomen of the individual by whose means they obtained the privilege of Roman citizenship. Slaves, on being manumitted, received the names of their masters, preserving their own names, by way of cognomen. Roman surnames generally had their origin from

some peculiar characteristic of body or mind; as Cato, from *catus*, wary, or subtle; Crassus, fat; Calvus, bald; Cæsar, bushy hair, &c.

In modern times, the names of individuals have been of two kinds—Christian and surname; the one received at baptism, and the other being the family name. But European surnames are comparatively of modern introduction. Before the arrival of the Normans in this country, men were usually named from their condition, residence, profession, or peculiarities of body or mind. Afterwards, scriptural names, or such as were applicable to some peculiar quality or office, were introduced as prænomens; thus we have John, Thomas, Stephen, Peter, James, Edward, Henry, &c. Females also received Christian names, which had their distinctive meanings. Thus Mary and Maria signified exalted; Isabel, lovely; Martha, bitterness; Gertrude, all truth; Julia and Juliet, soft-haired; Ellen, alluring; Caroline, regal; Charlotte, a queen; Eliza and Elizabeth, true; Clara, bright; Agnes, chaste; Amanda, amiable; Laura, laurel; Edith, joyous; Olivia, peace; Phœbe, light of life; Grace, favour; Sarah, a princess; Sophia, wisdom; Amelia, beloved; Matilda, a noble maid; Margaret, a pearl; Rebecca, plump; Hannah, Anne, Ann, and Nancy, kindness; Jane, dignity; Lucy, brightness of aspect; Louisa, one who protects; Emma, tender; Catherine, pure; Frances, frank.

As to the origin and history of surnames, we are told, both by Camden and Nesbit, that they were little known before the Norman conquest. Previous to that period, the ordinary distinctions in use were generally personal, and did not descend to succeeding generations of families, but were taken either from the name of the father; as John, the son of William, which eventually resolved itself into the surname of Johnson, or Williamson; or from complexion, trade, or stature; as Green, Brown, White, Long, Short, Tailor, Saddler, Smith, Weaver, &c. The surnames in the Domesday Book were introduced by the Normans, who had taken them themselves not long before; as John de Babington, which eventually became the family surname, the *de* or *of*, as in all similar names of local origin, having gradually been dropped.

According to the Sixteenth Annual Report of the Registrar-General, the surnames in England and Wales exceed 32,000 in number; the commonest being Smith, Jones, and Williams. The Smiths exceed a quarter of a million, and the Joneses are nearly as numerous. Taking half a dozen of our commonest names, we find that the proportion in which each stands to the general aggregate is as follows:—the Smiths are 1 in 73; Jones, 1 in 76; Williams, 1 in 115; Taylor 1 in 148; Davies, 1 in 162; and Brown, 1 in 174.

(Anacharsis; Verstegan's *Decayed Antiquity*; Camden's *Remains*; Nesbit's *Armoury*.)

NAPHTHA (vii. 388). Native naphtha is composed of three liquids, all very inflammable, viz. naphtha, C_{14}, H_{12}, naphthene, C_{16}, H_{16}, and naphthole, C_{24}, H_{24}. In certain parts of Asia, and also in the vicinity of the village of Andano, in Parma, it exudes from the earth. It is also mentioned by the Greek historians as exuding from the ground in various parts of Chaldæa, and particularly near Babylon. It is related that at Memnis there was a celebrated fountain, which threw out its naphtha in such quantities, that in building the walls of Babylon it was used to form the concrete. It is supposed to have been the perpetual fire of the Persians. Historians relate that on the arrival of Alexander at Babylon he was struck with wonder at seeing a vast gulf, that poured forth streams of fire, and a flood of naphtha, which, overflowing from its extraordinary quantity, formed a great lake near the gulf. This naphtha is described as being exactly like bitumen; but it had the property of taking fire so very suddenly, that, before it touched a flame, it ignited merely from the light that surrounded the flame, and set the air between both on fire. The barbarians, being desirous of showing the king the strength and subtle nature of this combustible substance, scattered several drops of it up and down, after his arrival in Babylon, in that street which approached the house he had chosen for his residence. After this, going to the other end of the street, they brought torches near the places where those drops had fallen (for it was night), and those which were nighest the torches taking fire on a sudden, the flame ran in an instant to the other end; by which means the whole street seemed in one general conflagration.

NAPIER, LIEUTENANT-GENERAL SIR CHARLES JAMES, G.C.B., was the grandson of Francis, fifth Lord Napier, and born at Whitehall, Westminster, in 1782. He received the rudiments of his education at Castletown, co. Kildare. Before he had completed his twelfth year he received an ensign's commission in the 22nd Regiment of Foot, and in four months was gazetted a lieutenant. So far his promotion was rapid; but an eventful period was approaching, and Napier was soon destined to take an active part. In 1803 he obtained his company; and in 1806, his majority in the 50th. He commanded this regiment during the disastrous retreat on Corunna under Sir John Moore, and was desperately wounded and taken prisoner. This deprived him of the opportunity of seeing further service in the Peninsula, but he reaped great distinction in other fields, and was rapidly promoted to the highest ranks. He was employed in the Mediterranean, and afterwards commanded a division of the Bombay army, and won the celebrated battles of Meanee and Hyderabad, overthrowing hordes of Sindians. [SINDE.] When certain later reverses in India alarmed the authorities in England, in 1849, Sir Charles was, with one voice, named commander-in-chief in India. In the latter responsible capacity he introduced several valuable reforms, and brought many offenders against the laws to trial. In 1850 he returned to England. But his health and spirits soon afterwards broke down, and he died at Oaklands, near Portsmouth, in 1853. 'Sir Charles's works on 'Military Law,' 'The Baggage of the Indian Army,' 'Lights and Shadows of Military Life,' &c., are held in much estimation.

NAPIER, MACVEY, professor of conveyancing in the University of Edinburgh, and one of the principal clerks of the Court of Session, was born about the year 1776. In 1799 he passed as a writer to the Signet; but his tastes were decidedly literary, and he soon became connected with the 'Encyclopædia Britannica,' of which he was appointed editor, in which position his profound erudition and sound judgment found ample scope. In 1829 he succeeded Lord Jeffrey in the editorship of the 'Edinburgh Review,' and for many years was a distinguished opponent of the 'Quarterly Review.' He died in 1847.

NAPLES (viii. 854–60). According to the census of 1851 the population of Sicily was 2,091,580; and the total population of the kingdom of the two Sicilies was 8,704,472. The kingdom of Naples is divided into 15 provinces, 52 districts, and 1840 communes; the entire area of which is 32,475 square miles.

NAPLES, YELLOW, the name of a pigment, said to be a mixture of the oxide of lead, zinc, and antimony. It was so called from its being formerly manufactured by a secret process at Naples, and used not only in oil-painting, but as an enamel colour.

NARES, REV. ARCHDEACON ROBERT, a learned critic and theologian, was the son of the celebrated musical Doctor, James Nares, of Stanwell, in Middlesex. He was educated for the church, and his promotions were rapid. He became Prebendary of Lincoln, Archdeacon of Stafford, Canon of Lichfield, and Rector of Allhallows, London. He was extensively connected with the literature of the day, and was the founder and editor of the 'British Critic. He was the author of 'Elements of Orthoepy,' 'A Chronological View of the Prophecies relating to the Christian Church,' &c. But the principal work, on which his reputation is founded, was his 'Glossary of Words, Phrases, &c., in the Works of English Authors of the Age of Queen Elizabeth.' He died in 1840.

NAS'SINÆ (Gr. *νάω* to swim), in conchology, a subfamily of the *Muricidæ*, of which the genus *Nassa* is the type, in which the shell is small, and the spire longer than the aperture.

NAS'UA (Lat. *nasus* a nose), a genus of the plantigrade Mammalia, natives of South America, and so called from the elongation and upward curve of the nose. They burrow at the foot of large trees, and frequently climb them in pursuit of birds or their nests.

NATAL, PORT (viii. 871). In 1814 the Cape of Good Hope and its dependencies (including Natal) were ceded by the Dutch to Great Britain; and since 1834 this settlement has been almost constantly occupied by British subjects. In the course of that year an officer of great experience, Dr. Andrew Smith, was sent to Natal, by the governor of the Cape, to examine into the capabilities of the country for colonization as to soil, climate, and water communication. His report was laid before the House of Commons, and gave great satisfaction to the country. Among other things he stated that the district of Natal was bounded on the west by the Umzimvooba River, on the south by the sea, on the east by the Umgana River, and on the north, by an undefined boundary. The country comprehends about 20,000 square miles, chiefly fitted for grazing and agricultural purposes. The more western portion presents numerous extensive flats, thickly covered with luxuriant grass, and abounds with rivers and rivulets. Trees fit for timber exist everywhere in sufficiency; and forests of considerable extent adorn the country. Grass thrives in profusion close to the very limits of the salt water, and large herds of cattle could be fed within the range of the guns of the fort. In consequence of these favourable reports the governor of the Cape recommended the formation of a colonial settlement at Natal, and several thousands of the Cape colonists migrated to the new colony, as well as numbers from the mother country. Of late years, however, the spirit of emigration has been more particularly directed to the Australasian regions, which has sunk the settlement of Natal into comparative shade.

NATATO'RES (Lat. *nato* to swim), in ornithology, a name applied to swimming birds, most of which have the toes united by a membrane, and the legs placed behind the equilibrium of the body. Their feathers are usually of an oily nature, with a thick coat of down beneath.

NATIC'IDÆ (Lat. *nato* to swim), a family of univalve testaceous Mollusca, of which the *Natica* is the type. The shells are generally smooth and round, and the aperture large and semicircular. The *Naticaria*, or sea-shells, and the *Naticellæ*, are different genera of the same family.

NATIONAL DEBT (viii. 871–4). In March 1856, the unredeemed debt amounted to 775,312,694*l.*; and the interest payable thereon to 22,267,361*l.* per annum. The debt consisted of 769,000,280*l.* three per cents.; 3,007,775*l.* two-and-a-half per cents.; 2,871,515*l.* three-and-a-half per cents.; and 433,124*l.* five per cents. The total reduction of interest effected in the year ending the same date was 37,236*l.*; and the total increase of interest, 747,243*l.* The total debt created in the same period was 24,908,134*l.*; and the total debt redeemed 1,241,257*l.*

NAVY, BRITISH (viii. 884–7). Within a very few years immense changes have taken place in our naval architecture and armaments. The introduction of steam is becoming universal; and the advantages of screw steamers, as vessels of war, are every day becoming more manifest. It is found that the screw-propelled vessel, relieved of the paddle-boxes, is less exposed to that heavy rolling motion occasioned by the oscillations consequent on the top weights on each side of a paddle-wheel vessel, when the boxes are acted upon by the heavy surges of the sea. The screw allows more freely the use of sails, and admits of considerable reduction in the beam or breadth of the vessel. Moreover the screw is little affected by alterations in the trim of the ship, being very nearly equally effective at all depths of immersion; and if entirely submerged, it may be driven by the direct action of engines placed so low in the vessel that both the moving power and the propelling machinery are safe from the damaging

effects of shot. In addition to these advantages, the decks of screw-propelled vessels are wholly available for broadside armament, and admit of full gunnery power being retained. But this new agency is still more valuable as affording the means of effectively realizing the fruits of victory, which by the active movements of steamers we shall be enabled to do. As to the increased size of vessels, fifty years ago their dimensions were, by common consent, at least, limited; the power of ordnance was practically stationary; the winds of heaven were our only propellers, and blew on all fleets equally. But now we build frigates much larger than the line-of-battle ships of that day. Our guns are incessantly improved—now by one, now by another, and the breech-loading rifled cannon by Sir W. Armstrong, which ranges four miles, may be quickly succeeded by another of twice its range. The paddle-wheel has made us independent of sails; the screw has made us independent of the paddle-wheel; and the 200 horse-power engine has been followed by the 1000 horse-power engine. During the late war with Russia, however, it was discovered that our heavy ships, both in the Baltic and the Black Sea, could not be rendered fully available in any effective attack on the enemy's fortifications, on account of the depth of water they drew; and therefore the British Government determined on the construction of a large number of iron-built gun-boats, which should be of shallow draft, and sail low in the water, with a few very heavy guns, that could be brought to bear against a fortified place at a near and effective range. In a very short time about 150 of these vessels were constructed; and in the late war with China were found most effective. Several floating batteries have also been built on the same principle, but of a more solid and bulky construction. Yet, with all their iron-cased strength, it does not appear that these floating batteries, or gun-boats, can withstand the tremendous force of Armstrong's breech-loading rifled cannon. Some experiments were lately made at Shoeburyness, at ranges varying from 200 to 400 yards, and the shots either passed through the side of the iron-cased floating battery, or penetrated and greatly damaged it. One of Armstrong's 12-pounder guns was stated to have driven a shot from a distance of 800 yards, through a body of solid oak timber several feet thick.

In a late lecture delivered at the Society of Arts by Mr. E. J. Read, it was stated, on the authority of official returns, that we had then in our navy (1858) 607 fighting ships, of an aggregate burden of 665,220 tons, and carrying engines of scarcely less than 100,000 horse-power. It was estimated that the cost of a ship of war, when rigged and equipped, might be set down at 35*l.* per ton, exclusive of the expenses of her armament and her engines, which might be reckoned at 60*l.* for every nominal horse-power. On this calculation, our ships alone have cost us nearly 22,000,000*l.*; and upon their engines we have made a further outlay of nearly 6,000,000*l.* Consequently we have invested in these ships nearly 28,000,000*l.*

In January 1858, the number of ships in commission was reported as follows:—

Home Station	71	*ships*	2148	*guns.*
East Indies and China	65	„	845	„
Mediterranean	23	„	585	„
Coast of Africa	22	„	129	„
North America and West Indies	16	„	350	„
Pacific	12	„	346	„
Particular Service	12	„	53	„
Brazils	7	„	125	„
Cape of Good Hope	5	„	137	„
Australia	3	„	49	„
	236		4767	

The number of officers, employed and unemployed, were thus reported:—Flag-officers, 297; captains, 666; commanders, 1030; lieutenants, 1715; masters, 475; engineers, 127; mates, 165; second masters, 105; chaplains, 150; naval instructors, 88; surgeons, 348; assistant-surgeons, 255; paymasters, 513; assistant-paymasters, 12.

In January 1859, the following was given as the state of the navy, including only effective ships of each class:—

Classes.	Afloat.		Building.	Total.
	Steam.	Sail.	Steam.	
Ships of the line	35	5	11	51
Block ships	9	—	—	9
Frigates	28	20	5	53
Corvettes	15	30	6	51
Sloops	23	40	4	67
Mortar ships	4	—	—	4
Floating batteries	8	—	—	8
Gun boats	163	—	—	163
Gun vessels	26	—	—	26
Small vessels of various denominations	—	106	1	107
Paddle steamers and tugs	75	—	—	75
	386	201	27	614

NEANDER, DR. JOHANN AUGUST WILHELM, Professor of Theology in the University of Berlin, and a distinguished ecclesiastical historian, was of Jewish parents, and born at Göttingen in 1789. He received his early education at Hamburg, and afterwards went to the university of Halle and Göttingen. At the age of sixteen he was converted to Christianity, and took the name of Neander (a new man). In 1811 he settled at Heidelberg, and occupied himself in writing his first work, 'The Emperor Julian and his Age,' which, in 1812, led to his being appointed Professor of Theology in that university. Shortly afterwards he was nominated to a professorship in the university of Berlin. Here he applied himself most assiduously to theological literature, and produced a number of valuable ecclesiastical works; among others, 'St. Bernard and his Times' (1813); and 'Memorable Occurrences from the History of Christianity and Christian Life.' But the most important work was his 'Universal History of the Christian Religion and Church,' issued from 1825 to 1845, in 5 vols. He died in 1850.

NEBRASKA, a newly-erected territory of the United States, established by Act of Congress in 1854. Its area is 275,000 square miles; and its population, in 1856, was 10,716. It is bounded N. by the north-west territory; E. by the State of Iowa, from which it is divided by the Missouri; W. by the Rocky Mountains, which separate it from Oregon and the Utah territories, and S. by the Kansas. The wrecks of the diluvian period of geology are scattered all over this territory, and especially north of the Missouri. Detached masses of rock, some of them hundreds of tons in weight, entirely unconnected with the adjacent geological formations, are interspersed through the whole country. The chief settlement yet formed is Council Bluffs on the Missouri, which is within this territory. It is of some importance as being the last civilized resting-place of the emigrant to the 'far West.' The chief tribes of Indians in Nebraska are the Omahees, the Poncahs, the Pawnees, and the Ottoes, of whom very little is known. According to the Act of Congress, which erected Nebraska into a territory, the inhabitants are allowed to determine whether slavery shall be admitted within the territory.

NECKAR, a river of Germany, which rises in the mountains of Schwarzwald, in Wurtemberg, on the frontiers of Baden, and flows north and west.—*Neckarkreiss* is the name of a province which takes its name from this river, in the north-west of the kingdom of Wurtemberg, about 55 miles long from north to south, and 36 miles broad. Its population, in 1852, was 501,034; and its area 1278 square miles.

NEC'ROMANCY (Gr. νεκρὸς dead, and μαντία prophecy), a sort of divination by consulting the spirits of the dead, somewhat similar to our modern spirit-rapping, and much practised by the ancients. The witch of Endor is a remarkable instance of the prevalence of the custom among the Jews. The Greeks performed the ceremony of invoking the dead in various ways; and if they appeared in an unsubstantial form they were called *psychomanteia*, or *skiomanteia*. No souls could, as they supposed, be so readily called up as those whose lives had been terminated by an untimely death, or by acts of suicide, because they were supposed to be detained at the confines of the nether world.

NECROPH'ORUS (Gr. νεκρὸς dead, and φορέω to bear), a genus of Coleopterous insects of the family *Clavicornes*. They have received the name of Burying Beetles, from their habit of burying the dead bodies of small animals, such as mice or frogs, and keeping them as receptacles for their eggs and larvæ. There are various species of this genus.

NEGRO RACE, one of the three great races into which the human family is divided. [CAUCASIAN and MONGOLIAN.] This race usually ranks as the lowest of the genus *Homo*, both in intellect and civilization. The nations which compose it are confined to the south of the Atlas Mountains, in Africa, and have always remained in a savage or semi-barbarous state; the mere slaves of a sanguinary despotism at home, or of Caucasian oppressors abroad. They are physically characterized by a jet-black skin and curly hair, a compressed and receding skull, a projecting muzzle, flattened nose, and thick lips, especially the upper one. Their whole aspect presents an approach to the simia tribe; their only superiority existing in the power of speech.

NELSON, a settlement of New Zealand, in Tasman Bay, Middle Island, which, since the discovery of gold in the locality, has assumed some importance in the map of the Australasian regions. The auriferous deposits are situated at about twenty miles' distance from the town of Nelson, and lie at a depth of about 5 or 10 feet, in a gravelly soil. They are found in flakes or pieces, ranging from minute grains to the size of a pea. According to recent accounts there were some hundreds of people engaged in the diggings, who were able to obtain, on an average, from half an ounce to one ounce per day. The town of Nelson possesses a very excellent harbour, and anchorage; and for several years past the chief proportion of the wool shipped from New Zealand has been the produce of this place. The settlement, though commenced only a few years since, is now in a very prosperous state. At the close of the year 1857 (says the 'Australian and New Zealand Gazette'), the quantity of land fenced in, and cultivated, was 19,401 acres, and of this extent there were 3379 acres of land laid down in wheat, 777 in barley, 1626 in oats, 14 in maize, 755 in potatoes, 4306 in English grasses, 633 in orchards, 6 in hops, and 664 in various other crops. The natives have in the province 309 acres of wheat, 9 of barley, 43 of oats, 111 of maize, 192 of potatoes, 31 in gardens, and 34 in various crops, with a population of about 6000 souls, spreading along 150 miles of coast, and separated by geographical features from the other colonies of New Zealand. Nelson has a parliament of its own, elected by almost universal suffrage, and this Parliament, or Provincial Council, has voted 32,933*l.* towards assisting schools, erecting reading-rooms, providing libraries, forming roads, bridges, and gutters, besides 8000*l.* to promote emigration, and a certain sum for an annual fund to keep up a monthly communication with Wellington and Canterbury, and a monthly communication between Cook's Straits and Melbourne. Of the entire expenditure of the colony, amounting to 32,138*l.*, not less than 26,500*l.* was appropriated, in 1855, to useful public works.

NEM'ALITE (Gr. νῆμα a fibre, and λίθος a stone), a mineral of a white-yellowish colour, opaque, with a silky lustre. *It* is so called from its occurring in slender filaments, which are elastic, and readily separated; specific gravity, 2·35. Its constituents, according to Dr. Thomson, are—magnesia, 51·72; water 29·66; silica, 12·57; peroxide of iron; 5·87.

NEMASO'MA (Gr. νῆμα, and σῶμα the body), a genus of Coleopterous insects, of the family *Zylophagi*.

NEMATOI'DEANS (Gr. νῆμα, and εἶδος resemblance), in zoology, an order of *Entozoa*, or worms which inhabit the intestinal canal. Their bodies are elongated, round, and filiform.

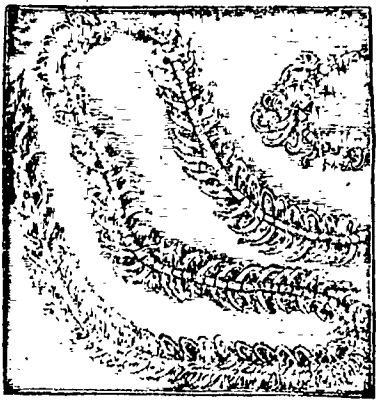
NEMATONEU'RA (Gr. νῆμα, and νεῦρον a nerve), in zoology, a division of the *Radiata*, in-

cluding that class of animals whose nervous filaments are distinctly traceable.

NEPTUNE, one of the newly-discovered planets of the solar system, first observed in 1849; the exact place of which had been long suspected, from the unexplained phenomena of the motions of Uranus, evidently caused by the attraction of some planet still farther from the sun. The simultaneous researches of Mr. Adams and Leverrier gave rise to the discovery of this new planet, which received the name of Neptune, and thus settled the interesting problem of the hitherto unexplained motions of Uranus. Though the elements of this planet may at present be regarded as merely provisional, his mean distance from the sun, calculating that of the earth as 1, is estimated at 30; his diameter at 45,500 miles; and his period of revolution, in mean solar days, at 164 years.

NEP'TUNISTS, in geology, a term applied to the followers of Werner, the celebrated mineralogist of Freiburg in Saxony. In the Wernerian system it was maintained that volcanic action was inoperative in the early history of the globe, and that all rocks, whether primitive or stratified, had been produced by a series of depositions formed in succession from water. Hence the followers of Werner, in their controversy with the disciples of Dr. Hutton, who advocated the igneous theory, received the appellation of Neptunists. But the fallacies of Werner's system, respecting the aqueous origin of all rocks, are now generally admitted; while the doctrines of Hutton, though little appreciated in his lifetime, have been adopted by all the leading geologists of modern times.

NEREITES CAMBRIENSIS, in geology, a fossil marine worm of the lower silurian or Cambrian sandstone, markings of which are frequently to be traced on the old red sandstone series of the Palæozoic epoch. To geologists it presents some interesting features, as being among the first indications of animal life, or at least of articulated beings.



NEREITES CAMBRIENSIS.

'Reposing on crystalline or metamorphic rocks, in which no fossil remains have yet been found,' says Professor Ansted, 'there have been traced in Wales, Cumberland, the south of Scotland, and various parts of Ireland, in the west of France, the north-west of Spain, the islands and shores of the Baltic, in Bohemia, in the Hartz, in many parts of eastern North America, on the western side and plateaux of the Bolivian Andes, in Brazil, in South Africa, and in Australia (?), a series of rocks, more or less altered, belonging to the lowest fossiliferous series.' Among the fossil remains found in these ancient rocks may be mentioned some small fishes of the shark tribe, tribolites, sea-weeds, chambered shells resembling the nautilus, univalve and bivalve shells, star-fishes, and marine worms, the most curious of which is the *Nereites Cambriensis*, as here represented.

NEUFCHATEL (viii. 921). On the 3rd of September, 1857, a formidable insurrection broke out at Neufchatel. The mountaineers of the valley of Verrières surprised the town and castle, and made the leading functionaries prisoners. The royalist party were at the head of the movement. The republicans of La-Chau-de-Fonds marched upon the town; and the Federal Council ordered the canton to be occupied by four federal battalions. The insurrection was eventually suppressed; but the king of Prussia evinced a disposition to interfere, and assert his ancient right to the sovereignty of the canton. This was resisted by the Federal Council; and the dispute ran so high as to endanger the peaceful relations of the two States; but the question was ultimately settled by the intervention of the European powers; and Prussia renounced her untenable claims.

NEW MEXICO (viii. 530). In 1850 this territory was formed out of the country ceded by Mexico to the United States, with the addition of a portion of that claimed by Texas. Its area is estimated at 210,774 square miles. The white population was then calculated at 61,525. In 1853 the Indian population was returned, by the commissioner of Indian affairs, at 45,900. Of the white inhabitants, above 58,000 are the descendants of the Spanish settlers, and all Roman Catholics. Of the ancient inhabitants, the principal are what are called Aztec, many of which are found along the banks of the Colorado and the Grande rivers.

NEW ZEALAND. [ZEALAND, NEW.]

NEWSPAPER, a sheet of paper printed and distributed for the purpose of circulating news. The history of our newspaper press presents one of the most remarkable phenomena in the social polity of Europe, and especially of Great Britain. The first newspapers may be traced to Germany or Italy. So early as 1524, printed sheets containing news were published at Augsburg and Vienna. But the progress of this species of periodical literature for 300 years was insignificant, when placed in comparison with the last half-century. In the year 1829 the number of newspapers published in the British metropolis alone amounted to about 18,000,000; in 1830, to 20,000,000; in 1831, to 22,000,000; and at the present time (1858) they are estimated at about 42,000,000. Many circumstances have contributed to their ever-augmenting circulation; as the abolition of the advertisement duty in 1853; the removal of the stamp duty in 1855; and the introduction of machinery, by

which ten or twelve thousand perfect copies can be produced in an hour. In London there are published eleven morning papers, viz. the Times, the Morning Chronicle, the Morning Herald, the Morning Post, the Morning Advertiser, the Daily News, the Public Ledger, the Standard, the Daily Telegraph, the Morning News, and the Morning Star. The number of copies cannot now be ascertained, owing to the abolition of the stamp duties; but it is well-known that the Times publishes each day from fifty to sixty thousand impressions, with twelve or sixteen large pages to each copy. In addition to these, there are eight evening papers, viz. the Globe, the Sun, the Express, the Evening Herald, the Evening Star, the Shipping Advertiser, Lloyd's List, and the Shipping and Mercantile Advertiser. Of weekly London papers, political and literary, there are 110, or thereabouts; some of which are purely of a local character, as the Islington Gazette, and Clerkenwell News, which sell at the low price of one halfpenny, and remunerate the proprietors by the vast number of advertisements they contain. There are 411 local newspapers in England; 131 in Scotland; 123 in Ireland; 22 in Wales, and 13 in the Isle of Man and the Channel Islands. It is difficult to estimate the total number printed; but it appears that in 1857 there passed through the post-office the enormous number of 71,000,000, of which one-fourth were transmitted by virtue of postage-stamps, and the remainder had the newspaper stamp affixed.

The important Act, for the regulation of newspapers, which passed in 1855 (18 and 19 Vict. c. 27), and still remains the law of the land, permitted newspapers to be printed either on stamped or unstamped sheets; and this has tended most materially to the augmentation and circulation of newspapers. According to this law, the papers intended for local circulation, or for transmission by parcel, need have no stamp; but if intended to be transmitted by post, they require a printed stamp, or otherwise must have a postage-stamp affixed to them. The printed newspaper stamp permits the paper to be transmitted and re-transmitted for fifteen days through the post-office; but if the journal is printed blank, and a post-office stamp is attached, it is only entitled to a single carriage and delivery. It is subject to the same regulations as the book-post rate of a penny for four ounces, twopence for eight ounces, and so on. The consequence of the abolition of the newspaper stamp duty is, that vast numbers of unstamped penny journals are everywhere published, and the reading of newspapers has become almost universal.

At the recent opening of the Westminster Athenæum, the Right Hon. Sidney Herbert made the following observations on the great importance of the newspaper press:—'Newspapers,' said he, 'are contemporary history, not always accurate, but not the less history. We have no time to sift matters for ourselves, and we look upon it as the business of the newspapers to tell us the news. But they do something beyond giving us news: they give to us the most admirable discussions upon all the contemporaneous questions of the day. There is no question abroad or at home, no question political, and very few scientific, which is not admirably discussed in the newspaper press of this country. The articles which appear in the newspapers, compressed into a short space, are the result of much reading and of much thought. It is to the press that we must look for the formation of the great mass of public opinion on political and social questions, and it is of importance to watch with the greatest care any defects capable of remedy which diminish the good influence the press exercises; and if any one can contribute to improve the strength of the press for good, and to diminish it when it tends towards evil, he can confer no greater benefit upon the community at large.'

NICHOLAS I., PAULOWITCH, Emperor of Russia, was the third son of the Emperor Paul, and born at St. Petersburgh on the 7th of July, 1796. On the assassination of his father, in 1801, his mother placed him under the tutelage of General Lamsdorf and the Countess Lieven, under whom he acquired the power of speaking the German and French languages with as much facility as the Russian. In 1814, after the termination of the great European war, Nicholas was sent on his travels, and in 1816 came to England, where he was cordially received. On his return he visited the different provinces of Russia, for the purpose of rendering himself acquainted with the resources and population of the empire. But the study of military tactics and fortification chiefly occupied his attention both at home and abroad. In 1817 he married Charlotte Louisa, the eldest daughter of Frederick William, King of Prussia, and sister of the present king. At that time Nicholas had little expectation of succeeding to the imperial crown; but on the 1st of December, 1825, his eldest brother, the Emperor Alexander, died at Taganrog, in the Crimea. The next heir to the throne was the Grand Duke Constantine, who was then at Warsaw, and Nicholas hastened to take the oath of fidelity. But his brother had already renounced the crown, and determined to retire to the post of Viceroy of Poland. Nicholas then ascended the throne. But a vast conspiracy, composed of two classes (the enthusiastic lovers of liberty, and the old Russian party, the supporters of Constantine), was formed. The troops were called upon to swear allegiance to the new emperor; but they had previously sworn fidelity to Constantine; and not understanding the reason for the change of masters they remained faithful to the oath which they had taken. When the ceremony commenced, the officers stepped out of their ranks, and denounced Nicholas as an usurper, and declared he held Constantine in confinement. The soldiers followed their officers, with cries of 'Constantine and the Constitution.' Milarodovitch, the Governor of St. Petersburgh and the veteran favourite of the army, was sent to parley with them. The Archbishop appeared in his ecclesiastical robes; but all in vain. The populace began to sympathize with the troops, when the Czar rode out, and confronted the rebels. Standing before them with haughty bearing, he cried in a firm tone, 'Return to your ranks—obey—down upon your knees!'

The energy of his voice, his countenance, calm, though pale, and the veneration with which every Russ regards the person of his sovereign, prevailed. Most of the soldiers knelt before their master, in token of submission. Victory was now easy. Wherever resistance was made the artillery played upon the gathering crowds, and the fire of musketry completed the work of destruction. In September 1826 the Emperor was crowned at Moscow, with great pomp and ceremony. Absolutism was henceforth his darling doctrine.

Soon after the coronation of Nicholas, war was declared with Persia, which, after continuing more than a year, was concluded by a treaty, whereby the Shah ceded two fine provinces to Russia. About a year afterwards Nicholas declared war against Turkey. Adrianople opened its gates, and Constantinople was itself in danger. In 1829 the peace of Adrianople was concluded, by which Nicholas was permitted to retain authority in Wallachia and Moldavia, and the Porte agreed to pay the expenses of the war. In 1830 the Polish insurrection broke out, Poland was reconquered, and an iron despotism was substituted for the semblance of constitutional government. In 1839 war was declared with Circassia, a war which, with little honour to the Russian arms, has continued to the present time.

In 1844 the Emperor paid a second visit to England, and was entertained by Queen Victoria, at Buckingham Palace and Windsor Castle, from the 1st till the 9th of June.

In 1849 Nicholas sent a Russian army into Hungary in aid of the Austrians, and the subjugation of that country was accomplished in August in that year. But the most important event of his reign was the recent war with Turkey and the Western Powers. It was the only unsuccessful and disastrous struggle in which he had ever engaged, and the reverses his army experienced probably occasioned a degree of excitement which shortened his life. It was commenced by the Emperor's minister Menchikoff, in March 1853, demanding a right of protectorate over those subjects of the Sultan who belonged to the Greek Church. The claim was refused, and a Russian army occupied Moldavia and Wallachia as a 'material guarantee' for enforcing it. In October of the same year the Porte declared war against Russia, and applied to France and England for their promised aid. The destruction of the Turkish fleet at Sinope in the same month was followed by the advance of the French and English fleets into the Black Sea. The English and French armies were next landed and encamped near Constantinople, whence they removed to the vicinity of Varna, and landed in the Crimea, September 14, 1854. They won the battle of the Alma, and by a flank march seized a position on the south side of Sebastopol. Then commenced the siege, which, after a severe struggle, was terminated on the 9th of September, 1855, by the capture of the town and all the forts on the southern side of the harbour of Sebastopol. Meantime, before this great feat had been accomplished, the Emperor Nicholas died at St. Petersburgh on the 2nd of March, 1855, and was succeeded by the present Emperor Alexander II. [CRIMEA; INKERMAN; SEBASTOPOL.]

As to the character of the Emperor Nicholas, it is universally agreed that he was such a personage as the ancients would have magnified into a hero, or a demigod,—herculean in his very frame, of uncommon stature, dignity, and grace, as if born to be a King of Men. Nothing this world can supply itself, or borrow from the unseen, was wanting to feed his ambition, to exalt his genius, to assist his undertakings. From the beginning of his reign he showed that he inherited and grasped, as in one possession, all the accumulated hopes and illusions of his dynasty. For thirty years he never ceased to push his scheme of empire; and when the epoch approached, which for ages has been designated for the triumph of the Cross over the Crescent, he could no longer restrain himself, but broke loose, as a river from its banks, for the conquest of the East. And it was only the united determination of the two great Western Powers of Europe that defeated his ambitious views, and neutralized the spirit of Russian aggrandisement.

NIGRITIA. [NEGRO RACE, *Suppl.*]

NIMROUD, or NINEVEH (viii. 979). Of the vast numbers of colossal figures and bas-reliefs excavated by Mr. Layard (all covered with cuneiform or arrow-headed characters, as exhibited at the British Museum), the most remarkable was the gigantic figure of *Nimrod*, as the inhabitants christened it. Mr. Layard's account of the discovery presents so characteristic a portraiture of the present inhabitants of this interesting but comparatively unknown portion of the globe, that we are induced to make a short extract:—'On the morning following these discoveries I rode to the encampment of Sheik Abd-ur-rahman, and was returning to the mound when I saw two Arabs of his tribe urging their mares to the top of their speed. On approaching me they stopped. "Hasten, O Bey, to the diggers, for they have found Nimrod himself. Wallah, it is wonderful, but it is true! we have seen him with our eyes. There is no God but God," and both joining in this pious exclamation, they galloped off, without further words, in the direction of their tents. On reaching the ruins, I descended into the new trench, and found the workmen, who had already seen me as I approached, standing near a heap of baskets and cloaks. Whilst Awad advanced and asked for a present, to celebrate the occasion, the Arabs withdrew the screen they had hastily constructed, and disclosed an enormous human head sculptured in full out of the alabaster of the country. They had uncovered the upper part of a figure, the remainder of which was still buried in the earth. I saw at once that the head must belong to a winged lion or bull, similar to those of Khorsabad and Persepolis. It was in admirable preservation. The expression was calm, yet majestic, and the outline of the features showed a freedom and knowledge of art, scarcely to be looked for in the works of so remote a period. One of the workmen, on catching the first glimpse of the monster, had thrown down his basket, and run off towards Mosul as fast as his

legs could carry him. I learnt this with regret, as I anticipated the consequences. As soon as the two Arabs had reached the tents, and published the wonders they had seen, every one mounted his mare, and rode to the mound, to satisfy himself of the truth of these inconceivable reports. As I had expected, the report of the discovery of the gigantic head, carried by the terrified Arab to Mosul, had thrown the town into commotion. He had scarcely checked his speed before reaching the bridge. Entering breathless into the bazaars, he announced to every one he met that Nimrod had appeared. The news soon got to the ears of the Cadi, who, anxious for a fresh opportunity to annoy me, called the Mufti and the Ulema together, to consult upon this unexpected occurrence. Their deliberations ended in a procession to the governor, and a formal protest, on the part of the Mussulmans of the town, against proceedings so directly contrary to the laws of the Koran. The Cadi had no distinct idea whether the bones of the mighty hunter had been uncovered, or only his image; nor did Ismail Pasha very clearly remember whether Nimrod was a true believer, prophet, or an infidel. I consequently received a somewhat unintelligible message from his Excellency, to the effect that the remains should be treated with respect, and be by no means further disturbed: that he wished the excavation to be stopped at once, and desired to confer with me on the subject. I called upon him accordingly, and had some difficulty in making him understand the nature of my discovery. As he requested me to discontinue my operations until the sensation in the town had somewhat subsided, I returned to Nimrod, and dismissed the workmen, retaining only two men to dig leisurely along the walls, without giving cause for further interference.'

NINGPO, a large sea-port town of China, situated on the banks of the great river Takia, in the province of Tche-Kiang, of which it is a first class city, and one of the five places named in the treaty of 1842, where British subjects are allowed to reside and trade. [China.] The city is fortified, and encompassed with a high wall six miles in circumference. It contains some large and important buildings. There is one temple in particular of vast size, with numerous columns and splendid ceilings varnished in gold and silver hues. The commerce of Ningpo is now very active among the Chinese themselves. About 670 junks come annually to this port from Shangtung and Leantung, which bring merchandise of every description. From the interior, 4000 vessels arrive annually by rivers and canals. The city is stated to contain about 300,000 inhabitants.

NITRAREA'CEÆ, an order of Exogenous plants, so called from the genus *nitraria*, found near the *nitre* works in Siberia. It consists of shrubs with deciduous leaves, or flowers, and a corolla of five petals. It has fifteen stamens, and the fruit is a drug.

NI'TROGEN (viii. 984). In the all-wise economy of the atmosphere we constantly breathe, nitrogen is of the first utility as a chemical regulator, of which a scientific contemporary thus eloquently writes:—'The ethereal fluid surrounding the earth, which we call air, is the source of a terrific power, called oxygen; and were it not for the regulator nitrogen, that is mixed with it, all the operations of Nature, which are dependent upon the air, would go at a velocity so frightful as to defy description. If a candle were lighted, it would instantly be burnt out. If a fire were lighted in a grate, not only the fuel, but the whole iron range, bars, trivet, and all, would be consumed. Life, instead of extending to threescore years and ten, would probably terminate in a week. We can thus perceive how much we are indebted to the Divine controller of the universe, who, in giving the air the power—oxygen—gave with it also its regulator—nitrogen. The air contains four parts of nitrogen to one of oxygen; so that when we breathe, we inspire nitrogen in much greater proportion than we do oxygen; yet, singular enough, this gas, nitrogen, has no direct action upon our lives; it is perfectly sweet; and it is this singular quality of nitrogen which renders it so very remarkable. Chemists cannot by any straightforward process make it unite with any other substance. It is a perfect bachelor or old maid among the elements. Nevertheless it does succumb to some of Nature's laws; for when the lightning flashes through the sky we find nitrogen united with hydrogen. A salt of ammonia is then produced; this, the rain brings to the earth; plants absorb it, and animals eat thereof. We find nitrogen as one of the constituents of animal tissue.'

NOBLE, an English coin current in the reign of Edward III., and valued at 6*s.* 8*d.* The *Rose-noble* was a gold coin, which was in use during the 14th century. (Knighton.)

NOCTILIONI'NA, in zoology, a subfamily of the *Vespertilionidæ*, so called from *Noctilio*, one of the genera. It comprehends those bats which have tubercular molars, with short and straight wings, and two phalanges to the forefinger.

NOCTUI'NA (Lat. *nocturnus* nightly), the Moth-butterflies, which seldom fly before sunset. It is a name given by Cuvier to the third family of the Lepidoptera.

NOM'ADES (Gr. νομὰς *leading* a pastoral life), a name given to those nations whose chief occupation is that of feeding and tending their flocks. The term was anciently applied by Herodotus, Strabo, and other Greek authors, to all those uncivilized tribes who had no fixed habitation, but like the Arabs of the present day, and the Nomades of India, Tartary, &c., are continually changing their locations in search of fresh pastures.

NON-COMMISSIONED OFFICER, in military matters, one of those subordinate officers of a regiment or company, who is appointed by the commanding officer, and not by royal commission. In a regiment of infantry non-commissioned officers consist of sergeants and corporals, the serjeant-major and quarter-master-serjeant, and the drum and fife-majors. An officer of this grade cannot be reduced to the ranks by the lieutenant-colonel or officer in command; but he may be reduced by the sentence of a court-martial, or by an order from her Majesty, or through the

commander-in-chief, or by order of the colonel of the regiment.

NORFOLK, County of (viii. 1002–8). According to the census of 1851, the population of the entire county was 442,714; of which 215,254 were males, and 227,460 females. Of houses, inhabited and uninhabited, there were 96,648. The area was estimated at 1,354,301 acres, or 2116 square miles, with 209 persons to a square mile. The population of the principal parishes and towns was as follows:—

Attleborough	2,324	Norwich	68,195
Aylsham	2,814	Old Buckenham	1,401
Castle-Acre	1,567	Outwell	1,448
Diss	2,419	Pulham St. Mary	1,414
Docking	1,640	Shipdham	1,769
Downham Market	2,867	South Lynn All Saints	4,772
East Dereham	3,372	Swaffham	3,858
Fakenham	2,240	Terrington St. Clement	2,250
Feltwell	1,675	Thetford	4,075
Gt. Yarmouth	30,379	Thorpe, St. Andrew	3,000
Harleston	1,509	Upwell	2,091
Hilgay	1,710	Walsoken	2,740
Hingham	1,698	Watton	1,353
Holt	1,726	Wells	3,633
Kenninghall	1,648	Wymondham	2,970
King's Lynn	19,355		
Methwold	1,669		
North Walsham	2,911		

NORTH AUSTRALIA, the geographical designation of that extensive portion of the Australian continent, lying north of the parallel of lat. 26 S. [AUSTRALIA, ii. 504, and *Supplt.*]

NORTHAMPTON, THE MOST HON. SPENCER JOSHUA ALWYNE COMPTON, second MARQUIS OF, was born in 1790. He was educated at Trinity College, Cambridge, and took the degree of M.A. in 1810. In 1812 his lordship was elected M.P. for Northampton. In 1815 he was married to the accomplished daughter and heiress of General Clephane; with whom a great portion of his time was spent at Rome—their house forming the great centre and attraction of the wit and genius of Italy, until death prematurely carried off this accomplished lady. The name of the Marquis of Northampton, however, will be chiefly remembered for his devotion to science, and his great taste in literature. His lordship was one of the earliest occupants of the President's chair at the Geological Society. He also occasionally presided at the British Association for the Advancement of Science. In 1838 he was elected President of the Royal Society, which honourable position he held till 1849; and during that time greatly contributed to the prosperity of the Society. Of the Archæological Society, founded in 1844, he became the chief patron, and presided at the meeting held at Winchester in 1845. It was then that the designation, at the suggestion of his lordship, was altered to 'The Archæological Institute of Great Britain and Ireland.' He was present at all the subsequent annual meetings, and mainly contributed to its success. But his lordship's ever-active and accomplished mind was not entirely confined to these duties. He applied himself to the Belles-Lettres and the lighter species of literature. Some of his poetical productions have appeared in various publications, and are specimens of good feeling and taste; especially in an interesting volume called the 'Tribute,' the management of which his lordship undertook for the benefit of Mr. Smedley's bereaved family. This was one among the many instances of Lord Northampton's unostentatious benevolence, and which all those connected with science, literature, and the fine arts, have reason to appreciate. He died in 1851.

NORTHAMPTONSHIRE (ix. 5–10). According to the census of 1851, the population of the county was 212,380, of which 105,984 were males, and 106,396 females. Of houses, inhabited and uninhabited, there were 45,480. The area was estimated at 630,358 acres, or 985 square miles, with 216 persons to a square mile. The population of the principal places was as follows:—

Brackley	2,157	Northampton	26,657
Daventry	4,430	Oundle	2,689
Eye	1,442	Peterborough	8,672
Finedon	1,588	Raunds	1,870
Irthlingborough	1,577	Rothwell	2,278
Kettering	5,125	Rushden	1,460
King's Cliffe	1,407	Towcester	2,478
Kingsthorpe	1,586	Weedon Beck (ex Barracks)	1,996
Long Buckby	2,341	Wellingborough	5,061
Moulton	1,511		

NORTHUMBERLAND (ix. 10–18). According to the census of 1851, the population of the entire county was 303,568; of which 149,515 were males, and 154,053 females. Of houses, inhabited and uninhabited, there were 49,801. The area was estimated at 1,249,737 acres, or 1952 square miles, with 154 persons to a square mile. The population of the principal towns and parishes was as follows:—

Allendale .pa.	6,383	Longbenton	2,238
Alnwick	6,231	Lowick .pa.	1,941
Ancroft	1,883	Morpeth mun.	4,096
Beddlington pa.	5,101	——— pa.	10,012
Berwick-upon-Tweed	15,094	Newcastle-upon-Tyne	87,784
Chatton .pa.	1,765	Seaton Delaval	2,726
Chirton	3,960	Seghill	1,869
Cowpen	4,045	South Blyth	2,060
Cramlington	3,867	Spittle	1,746
Ford .pa.	2,322	Tynemouth	29,170
Haltwhistle	1,420	Tweedmouth	3,054
Hartley	1,627	Wallsend	2,161
Haydon	2,085	Walker	3,963
Hexham	4,601	Willington	2,284
Killingworth	1,651	Wooler .pa.	1,911

NORTH-WEST PASSAGE. [ADMIRALS ROSS, and PARRY, *Supplt.*]

NOTACAN'THA (Gr. νῶτος the back, and ἄκανθα a spine), a family of Dipterous insects, so called from their having the upper part of the thorax covered with spines.

NOTACAN'THINÆ, in zoology, a subfamily of the *Zeidæ*, of which the *Notacanthus* is the genus. The body is anguilliform, and covered with small scales; the snout lengthened, and the dorsal and anal fins very long.

NOTHUS (Gr. νόθος spurious), a genus of Coleopterous insects, of the family *Stenolytra*.

NOTONECTIDÆ (Gr. νῶτος the back, and νηκτὸς floating), a family of Hemipterous insects, of which the genus *Notonecta*, or Waterboatman, is the type.

NOTOP'ODA (Gr. νῶτος, and πόδες feet), in zoology, a division of the Brachyurous Decapoda.

NOTORHI'ZEÆ (Gr. νῶτος, and ῥίζα a root), in botany, a suborder of the Cruciferæ, in which the cotyledons are flat and incumbent.

NOTT, MAJOR-GENERAL SIR WILLIAM, a distinguished British commander, was born at Neath, co. Glamorgan, in 1782. At the age of eighteen he entered the East India Company's Service; and four years after his arrival at Calcutta, he distinguished himself by a signal chastisement inflicted on the natives of Muckie, for their barbarous treatment of the crew of an English ship, and other outrages. In 1839, after having repeatedly distinguished himself, he was invested with the command of the troops in Sinde and Lower Affghanistan, when he displayed great discrimination and ability. In 1841 he established his head-quarters at Candahar; and at the close of the year a formidable insurrection broke out at Cabool, where he attacked and defeated a large hostile force, under Prince Sufter Jung. The state of Affghanistan assuming, at this period, a most formidable aspect, General Nott, in March 1842, left Candahar, and marched upon Ghuznee with about 5000 troops; and when within thirty-eight miles of that fortress, he engaged and utterly defeated a body of the enemy, amounting to 12,000 men. On the 6th of September, Nott arrived before the walls of Ghuznee; and the enemy were compelled to submit. The citadel, with all its works, having been demolished, Sir William Nott proceeded on his route to Candahar. Notwithstanding all resistance he was enabled, on the 17th of September, to effect a junction with General Pollock at Cabool. In December 1842 he was nominated K.G.C., and received the thanks of both Houses of Parliament. The East-India Court of Directors also voted him an annuity of 1000*l*. On his return to his native country he lived a retired life on an estate which he had purchased at Carmarthen, where he died in 1845.

NOTTINGHAMSHIRE (ix. 28–32). According to the census of 1851, the population of the entire county was 270,427; of which 132,263 were males, and 138,164 females. Of houses, inhabited and uninhabited, there were 56,521. The area of the county was estimated at 526,076 acres, or 822 square miles, with 329 persons to each square mile. The population of the principal parishes was as follows:—

Arnold . . .	4,704	Greasley . .	5,284
Basford . . .	10,093	Huckwall Torkard	2,970
Beeston . . .	3,016	Kirkby in Ashfield . . .	2,363
Bingham . .	2,054	Lenton . . p.	5,589
Bulwell . . .	3,786	Lenton . . .	4,527
Carlton . . .	2,329	Mansfield . .	10,012
Clarborough .	2,504	Mansfield Woodhouse . . .	1,972
East Retford mun.	2,943	Misterton . .	1,743
—— pa.	46,054	Newark . . .	11,330
Eastwood . .	1,720	Nottingham .	57,407
Radford . . .	12,637	Southwell . .	3,516
Ruddington .	2,181	Sutton in Ashfield	6,542
Selston . . .	2,101	Worksop . .	6,058
Snenton . . .	8,440		
Stapleford . .	1,968		

NOVACULI'NA (Lat. *novacula* a knife), a genus of Mollusca, of the family *Solens*, in which the shell is straight, the valves of equal length throughout, and the extremities rounded.

NUGGET, a lump of gold found in its native bed, or among the *débris* of the primitive rocks in which it was produced. It was originally spelt *niggot*, which was probably a corruption from *ingot*. But whatever be the origin, it is certain that no word is become more familiar to the public, since the discovery of the Californian and Australian gold diggings, than the term *nugget*. Some years ago, the Ural Mountains yielded a lump of gold weighing 70 lbs., which was considered an extraordinary production. But the size and value of the nuggets, found at various times in the colony of Victoria, have far surpassed all the discoveries of past ages. One dug up at Bendigo, weighing 27 lbs. 8 oz., and another 28 lbs., were at the time considered so extraordinary, that the latter one was purchased by the local government for presentation to the Queen. Shortly afterwards other masses were discovered in the neighbourhood of Ballarat, weighing from 45 to 105 lbs. But the largest and most extraordinary one weighed in gross about 134 lbs.; and contained of solid virgin gold about 126 lbs.

NUMERALS, ROMAN (ix. 49). The numerals, by which the Romans made their calculations, and which to this day are in general use for inscriptions, &c., consisted of seven symbols, apparently representing seven alphabetical letters, viz. I, V, X, L, C, D, and M. How they originated has often perplexed the ingenuity of the learned. That they were the rude invention of a semi-civilized people, and that people the early Romans, is generally admitted, because inscriptions have been found, in these numerical characters, with dates anterior to the first Punic war. The Hebrews, the Greeks, and other ancient nations, adopted the common letters of the alphabet as signs of number; but the Romans, who were never celebrated as skilful arithmeticians, confined themselves to the seven letters just mentioned, which we call numerals. Why they adopted the letter C as the initial of Centum for 100, or M as the initial of Mille for 1000, is readily understood; but why V should stand for 5, X for 10, or L for 50—these letters not being the initials of any corresponding words—is more difficult to account for. 'There is only one way of explaining the matter (says Dr. Nuttall, in his 'Archæological Dictionary'), and it shows, at the same time, the rude simplicity of the primitive Romans. In the first place, the unit appears to be naturally represented, like the Arabic figure of 1, by a single perpendicular line, according to the simple notation of an unlettered individual. Thus the Chinese, who are undoubtedly the most ancient people in the East, have for ages represented the number 1 by a simple straight line, the number 2 and 3 by similar lines, and the decimal number 10 by the

unit line crossed thus +. This being the common and simple origin of the unit system, and the numbers 1, 2, 3, 4, &c., denoted by simple lines, being ||||, we may presume that some means would soon be devised to shorten the repetition of these digits. Hence, among the early Romans, the character representing FIVE appears to have been produced by a diagonal or fifth line drawn across the four units, thus ⋀, which evidently resembles the letter V. Untutored savages thus count the number four by their four fingers, and then cross them with their thumb to denote the number five. The union of the two characters denoting V will produce the letter X, which answers to twice five, or ten. The savage also counts the same number by the union of his two hands. As it would have been inconvenient to write eight or nine X's for 80 or 90, the sign for 50 appears to have been produced by cutting off the upper half of the letter C, the initial of centum, which, before the use of uncial or curved letters, had a square form, thus E L. In the same manner, for producing the number 500, the first half of the uncial letter ↀ, the initial of mille, was cut off; thus producing a character similar to the letter D; and a line drawn over any one of the numerals increased it to as many thousands; thus $\overline{D}$ stood for 500,000, $\overline{L}$ for 50,000, and so on.' Sometimes the number 1000 is represented by CIↃ (which is a rude representation of the uncial letter ↀ), and 500 by half the initial, IↃ.

NUM'MULITES (Lat. *nummus* money, and Gr. λίθος a stone), in geology, an extinct genus of multilocular Cephalopods, having externally a lenticular formation, with no apparent opening, and internally a spiral cavity, divided by septa into numerous chambers, which communicate by means of small foramina. They are found in great quantities in the lower tertiary and upper secondary strata, and are so called from their resemblance to a small piece of money (*nummulus*).

NUMMULITES.

No. 1 is the external surface of the shell.
No. 2, an internal section, the light parts showing the septa, or chamber walls of the shell.

They vary in size from a crown-piece to microscopic minuteness; and are often found piled on each other in nearly as close contact as the grains in a heap of corn. Thus have they contributed to the chalk formation of the Alps, Carpathians, Pyrenees, and other mountain heights. A great part of Paris is built with a limestone of this kind. In fact, the remains of these minuter animals have contributed more to the mass of materials composing the earth's exterior crust, than the stupendous bones of the whale, hippopotamus, or elephant. It is impossible to contemplate such mountain masses of the fossil remains of a single family of shells, thus added to the solid materials of the globe, without bearing in mind that each individual shell once bore a living animal; and that at far-distant epochs the great waters of the ocean, which then covered Europe, were swarming with this extinct race of mollusks. We find that entire mountains, in the neighbourhood of the Mediterranean, consist of these shells. In fact, the pyramids of Egypt are principally built of a limestone composed of Nummulites. This circumstance was noticed both by Herodotus and Strabo; and they, in ignorance of geological science, gave it as their opinion that these shells were the petrified remains of the lentils used as food by the workmen employed in the construction of these stupendous edifices. How many myriads of ages must have passed away since these vast stones were mere floating deposits of the ocean, teeming with animal life!

NUS'SIERITE, a mineral of a yellow-grey or green colour, occurring in lenticular crystals, so called from *Nussiere* in France, where it is found. Its specific gravity is 5·04; and its constituents are chiefly phosphates of lead and of lime; chloride of lead; and arseniate of iron.

NUT-PINE (the *Pinus monophyllus*), a new species of pine, growing in the Rocky Mountains. The cones of this tree contain oily, nutritious, and agreeable seeds, on which many of the Indian tribes chiefly subsist.

NU'TRIA (*Myopotamus coypus*, v. 57), the commercial term for the fur of the Coypu, which is imported in very large quantities from South America. The skin is either shorn as a hatting fur, or dressed as a peltry. Upwards of a million of these skins have been annually imported from the River La Plate; but this large importation has of late years declined to about 20,000. (Simmond's *Dict. of Trade Products.*)

NYC'TERIS (Gr. νύξ τῆρις a night-bird), a genus of bats, of the family *Vespertilionidæ*.

NYC'TEUS (Gr. νύξ, νυκτὸς, night), a genus of Coleopterous insects, of the family *Cerbrionites*, whose flight is chiefly by night.

[In zoology there are a variety of names compounded of the syllable *Nyct* (νυκτὸς of night), which are expressive of the animal's habits; as *Nycthemerus*, a genus of birds of the Pheasant kind;—*Nyctia*, the Eagle Owls, of the family Strigidæ;—*Nycticrardea* (night heron), a genus of birds of the family Ardeadæ;—*Nyctibius* (night-life), a genus of birds of the family Caprimulgidæ;—*Nycticebus* (night-monkey), the Slow Lemur;—*Nyctinomus* (night-roaming), a genus of bats, of the family Vespertilionidæ, which inhabit dark and subterraneous ruins in Egypt;—*Nyctiornis* (night bird), a genus of birds of the family Meropidæ;—*Nyctipetes* (night-fliers), Sparrow Owls, of the family Strigidæ;—*Nyctophilus* (night-loving), a genus of Bats, of the family Vespertilionidæ].

NYMPHÆ'A (Gr. νύμφη a nymph) was the name of twelve public baths at Rome, which were celebrated for their beauty and convenience. They were so called because they were consecrated to the Nymphs, and adorned with their statues. Near Naples is still to be seen the remains of a

similar bath, which is a square building, all of marble. The walls are covered with shell-work representing the twelve months of the year, and the four cardinal virtues.—*Nymphæa* was also a term applied to fountains consecrated to the Muses.

O.

OAKS (ix. 1007—QUERCUS). Sir Wm. Simmonds, in speaking of the longevity of these monarchs of the forest, says that the Parliamentary oak, in Clipstow Park, is about 1500 years old. This park belongs to the Duke of Portland, and existed before the Conquest. The tallest oak was higher than Westminster Abbey, and was called the Duke's walking-stick. The Calthorpe oak, in Yorkshire, which measures seventy-eight feet in circumference at the base, is the largest in England. The Three Shire oak, at Worksop, so called from forming parts of the counties of Nottingham, Derby, and York, has the greatest expanse of any recorded in this island, drooping over 777 square yards. The most productive oak was that of Gelenos, in Monmouthshire, felled in 1810; the bark brought 200*l.*, and its timber 670*l.*

The bark of the oak is largely used for tanning, and the inner cortical of young trees, as containing a larger proportion of tannin, is always preferred. Our home supplies of oak-bark are estimated at about 250,000 tons per annum; and, in addition, 4000 to 5000 tons are imported from abroad for the use of our tanners.

O'ASES, a name given to those fertile spots, watered by springs, and surrounded with verdure, which sometimes are found in the great sandy deserts of Egypt and other parts of northern Africa. These oases have been described by Humboldt as 'spots of verdure which display palm trees and springs of water.' They have also been noticed by the old Greek writers. Strabo says that the Egyptians gave the name to inhabited spots surrounded by vast deserts of sand, resembling islands in the sea. There were many such in Lybia, and modern discoveries have made us acquainted with several in the African Sahara, which are rich in streams and vegetation. In the western part of Fezzan lies the small lake of Mandia, which was visited by Captain Clapperton on his memorable expedition from Tripoli. There was here a deep sand valley containing two large groves of date trees, in which the lake was inclosed. He describes the contrast between the desert plains of sand, and this insulated spot, as causing the finest sensations of delight. With the exception of these green spots of earth, the great Sahara, for 3000 miles, is uninhabitable for man.

OATHS (ix. 59). In 1854, this privilege, which has been long enjoyed by Quakers and Moravians, was, by the Common Law Procedure Act, extended to all witnesses who conscientiously object to be sworn. But their solemn declaration involves them in the same pains and penalties, if proved to be false, as those which are attendant on the commission of wilful perjury.

OBLA'TION (Lat. *oblatus* brought to or before), an offering, or anything given as an act of reverence to the use of the church. The custom of oblations commenced in the early ages of Christianity; the ministers of religion, for the first two or three centuries, depending entirely on the free gifts or oblations of the people for their maintenance. But the custom became, in subsequent periods, exposed to many abuses and extortions, which were continued even after a legal or state provision had been made for the priesthood. During the Middle age there was a great variety of these oblations, as mentioned by our early historians, which were considered very oppressive. Thus there were the *Oblationes Altaris*, the fees of the priest for saying mass; *Oblationes Mortuorum*, or *Funerales*, given at funerals; *Oblationes Defunctorum*, which were given to the church by the last will and testament of persons dying; *Oblationes Penitentium*, offerings made by persons who were penitent; *Oblationes Pentecostales*, &c. The chief or principal feasts, for the oblations of the altar, were All-Saints, Christmas, Candlemas, and Easter; which were called 'Oblationes quatuor principales:' and of the customary offerings from the parishioners to the parish priest, solemnly laid on the altar, the mass or sacrament offerings were usually three-pence at Christmas, two-pence at Easter, and a penny at the two other principal feasts. Under this title of Oblations were comprehended all the accustomed dues for Sacramentalia or Christian offices; and also the little sums paid for saying masses and prayers for the deceased. *Oblationes Funerales* were often the best horse of the defunct, delivered at the church gate or grave to the priest of the parish; to which old custom we owe the origin of Mortuaries, &c. [MORTUARY, *Supplt.*] (Kennet's *Paroch. Antiq.*)

OBSID'IONAL CROWN (Lat. *obsidium* a siege), a wreath or crown, with which the Roman generals were honoured, who had delivered the army from the dangers of a siege, or when they were surrounded by an enemy. It was simply made of grass or herbs found upon the spot where the action had been performed, and placed on the brows of the relieving general by the soldiers themselves.

OCCUPATIONS OF LIFE. [TRADES, &c., *Supplt.*]

OCEAN (ix. 70). The vast expanse of ocean, which surrounds this terraqueous globe, has been

already noticed; but its varied depths have formed the subject of more recent investigations. The laying down of the telegraphic wires has of late opened a new field of interesting discovery; and each year we may expect the secrets of old ocean's bed to be more fully developed. In sounding the Atlantic Ocean for the telegraphic cable, lately conveyed from Ireland to Newfoundland, the greatest depth attained has been 2070 fathoms (about two miles and one-third). But the bed of the Atlantic, for more than 1300 miles, is now found, in the direct line of the tract, to present an almost unbroken plain, chiefly of sand deposits, similar in stratification to the old sand formations of the earth's crust. As a general principle, however, it may be observed, that inequalities similar to those which mark the surface of the dry land appear to characterize the bed of the ocean. In some places it is a mere shallow or sandbank; in others it is unfathomable, or at least no plummet has ever been able to sound its depth. Off the coast of Greenland, Captain Scoresby sounded to the depth of 7200 feet without reaching the bottom; and Lord Mulgrave, in the North Sea, let down a heavy sounding lead to the depth of 4700 feet with the same result. In the South Atlantic, lat. 15° 3′ S., long. 23° 14′ W., Sir James Ross, with a line of 27,600 feet, was unable to find any bottom; and this appears to be the greatest depth which has yet been satisfactorily ascertained. This spot was not less than 486 miles from the island of Trinidad, and 1180 miles from the nearest point of land in South America.

It is generally found, as already observed, that along a low, level, and sandy shore, the sea is found shallow; while in the neighbourhood of a bold and mountainous coast, the reverse takes place. Thus the recession of the tide from the flats of Holland or of Lincolnshire, converts large tracts into dry land; while in the Mediterranean, where Mount Athos rises abruptly to the height of 6000 feet, there occurs a depth of five or six hundred feet close to the shore. Around St. Helena, which projects to a great and sudden elevation, the depth of the surrounding ocean is found to be unfathomable. From these facts we may analogically infer that between the heights of the elevated lands and the depths of the ocean, there is some degree of correspondence; and if this be admitted, the greatest depths of the sea may be equal to the loftiest peak of the Himalayan range, or about 30,000 feet. [MOUNTAINS, *Supplt.*] But Professor Ansted gives it as his opinion, that there is not any reason for supposing that the mean depth of the ocean bears any corresponding relation to the elevation of mountains. 'It is generally in the open sea, at a distance from land,' says he, 'that the depth is the greatest; but this is not universally the case; for in the Pacific the bed of the sea has an abruptness which has nothing to correspond to it among the mountains.'

O'CONNELL, DANIEL, the Irish 'agitator,' of Darrynane Abbey, was the son of a small landed proprietor in the county of Kerry, and born in 1775. Having been originally intended for the priesthood, he was educated at the Catholic college of St. Omer; but on the repeal of the Act which prohibited Roman Catholics from practising at the bar, he entered himself as a student of Lincoln's Inn. In 1798 he was admitted to the bar; and soon acquired a large practice. In 1809 he became connected with the turbulent associations whose declared object was the emancipation of the Catholics from political disabilities. Here his energetic and ready eloquence gave him a great ascendancy; but his language was at times so violent that it often involved him in personal quarrels; and in 1815 he fought a duel with Alderman d'Esterre, which proved fatal to the latter. This lamentable result induced him to renounce all hostile meetings of a similar character; to which resolution he rigidly adhered through life. In 1823 he founded a new Catholic Association, the history of which is identified with that of Ireland. In 1828, notwithstanding the existing Catholic disabilities, he was returned as member for the county of Clare; and in the next session, the Roman Catholic Relief Bill having been introduced and carried, he was enabled to sit without taking the oaths against Romanism. In 1841 he was elected Lord Mayor for Dublin; and in 1843 he became the presiding genius of the 'monster meetings,' with which all Ireland was long agitated; their ostensible object being the repeal of the Irish union. The government at length interposed, and prevented a monster meeting at Clontarf. Mr. O'Connell was brought to trial, and sentenced to a fine of 2000*l.*, and twelve months' imprisonment; but the judgment was subsequently reversed by the House of Lords. In 1845-6-7, Ireland, owing to the ravages of the potato disease, and the unsettled state of the country, was reduced to the lowest state of social misery and degradation; when, perhaps fortunately for the good of his country, Mr. O'Connell retired from the arena of public life, and undertook a pilgrimage to Rome; but on his journey he was stricken with a fatal illness, and expired at Genoa in 1847, aged 71.

OCTAHED'RITE (Gr. ὀκτὼ eight, and ἕδρα a base), 'in mineralogy the octahedral oxide of titanium.'

OCTAVES, the term applied to those repetitions of the service of the grand festivals, the eighth day after the festival itself. The custom originated in the first ages of Christianity, and was in general use up to the Saxon times.

ODE (Gr. ᾠδή a little song), a short lyrical composition, usually intended to be sung, and accompanied by some musical instrument, particularly the lyre, whence the name of lyric verse; of which the odes of Anacreon and Horace are the most celebrated in classical literature. The ode was in all probability the earliest species of poetry; being first applied in the infant ages of Greece, to celebrate the praises of gods and heroes; but in later ages the ode was devoted to the lighter subjects of love, gallantry, and wine. The odes of the ancients had a regular return of the same kind of verse, and the same quantity of syllables in every similar verse, according to the laws of ancient rhythmus. The modern musicians, who have attempted to set Greek or Latin odes to music, have often neglected this rule of suiting the tune to the metre, and have made short syllables long, and long syllables

short. Hence their great want of success in adapting modern music to ancient rhythmus. (Nuttall's *Treatise on Latin Versification.*)

ŒRS'TEDITE, a mineral of a splendid lustre, found at Arundel, in Norway. It is of a brown colour, and crystallized. Its constituent parts are titanate of ziconia, silica, lime, magnesia, protoxide of iron, and water; specific gravity 3·628.

O'KENITE, a mineral found in fibrous masses of minute crystals, found at Dico Island, Greenland. Its constituents are silica, lime, and water.

OL'IVENITE, a copper ore of an olive-green colour, consisting of oxide of copper, 63·00; phosphoric acid, 26·6; water, 8·4. It occurs in micaceous clay slate.

OLIV'INÆ (Lat. *oliva* the olive tree, and one of the genera), in conchology, a subfamily of the *Volutidæ*, or Volutes, the shells of which are smooth and slightly polished, and the spine very short.

OMNIBUS. [CARRIAGES, *Supplt.*]

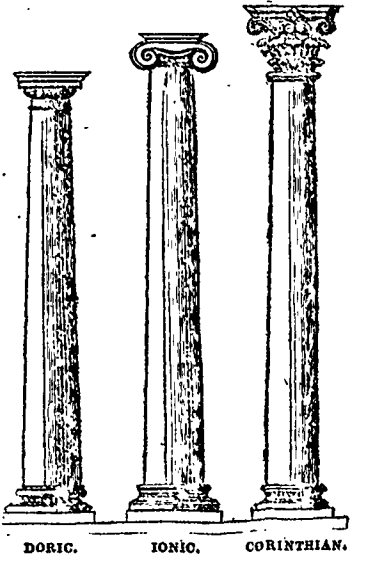
ONISCID'IA, in conchology, a genus of the *Nassinæ*, the shell of which has the shape of *Cypræ Cassis*, but less ventricose. The *Oniscia* is a genus which differs from Cassis in the canal of the shell not being suddenly reflected.

OPHIOL'ATRY (Gr. ὄφις a serpent, and λατρεία worship), a name applied to that serpent worship which extensively prevailed among the Eastern nations of antiquity. The winged serpent of the Egyptians, Cneph or Cnuphis, was esteemed the good genius and creator of the world (the Agatho demon), and enters largely into the whole range of Eastern mythology. This monstrous kind of adoration appears at one period of history to have been more prevalent than any other; and even existed among the Mexicans, and nations of the northern latitudes of Europe. It is difficult to account for its origin; but the most probable idea is that it was derived, by the early astronomers, from the serpentine convolutions of the heavenly zodiac, which in the course of ages were sung and mythologized by the poets, and then reduced to a religious system by the priesthood of those barbarous ages.—Even among the early Christians, there was a sect called *Ophites*, who worshipped the serpent that seduced Eve. They taught that this serpent was instructed in all knowledge, and was the father and author of all sciences. The Sethites, mentioned by Theodoret, were of a similar faith.

OPIE, MRS. AMELIA, the celebrated novelist and poetess, was the daughter and only child of Dr. James Alderson, of Norwich, and born in 1769. She lost her mother in 1784, and the duties of superintending her father's household thus early devolved upon her. In 1798 she married Mr. Opie, the painter, and in 1801 made her first appearance as an author in the tale of 'Father and Daughter,' although she had previously written one or two tragedies, and published anonymously a novel, entitled 'The Dangers of Coquetry.' This tale laid the foundation of the opera of 'Agnese,' by Paer. In 1802 she brought out a volume of 'Poems.' The same year she made an excursion to France, in company with her husband, of which she afterwards published an account in Tait's Magazine. In 1804 she produced the novel of 'Adeline Mowbray,' in three vols., which extensively contributed to her reputation as a writer of fiction. In 1805 her 'Simple Tales' made their appearance. In 1807 our fair authoress had the misfortune to lose her husband, when she returned to the home of her father, at Norwich, from which she never departed. Here she devoted herself to literature, and among other works produced 'The Warrior's Return and other Poems,' 'Temper, a Tale;' 'Tales of Real Life;' 'Valentine's Eve,' a novel; 'Tales of the Heart;' 'Madeline;' 'Illustrations of Lying;' 'Detraction Displayed,' &c. In fact, she wrote so rapidly, that many of her writings display a negligence of style, which often detracts from the brilliancy of her genius. In early life she had formed a close intimacy with the Quaker families of Mrs. Fry and the Gurneys; and in 1825 she joined the Society of Friends, of whom she had long been a great admirer. Her latter years were spent in occasional visits to the Continent, of which she published some interesting accounts. In 1833 she brought out a volume of poems, entitled 'Lays for the Dead,' and in 1840 appeared, in Tait's Magazine, the account of her tour in Belgium and Switzerland, which she had made in 1835. She died at Norwich in 1853.

ORBIC'ULA (Lat. a little round base), a genus of Mollusca, of the class *Brachiopoda*; the shell consisting of two unequal valves, one round and conical, and the other flat.

ORDERS. The characteristics of the different Orders of Grecian architecture have been noticed under CIVIL ARCHITECTURE (iv. 606, 614); and also under the general head of ARCHITECTURE (*Supplt.* p. 77), where the representation of a Doric column, from the Parthenon, is given with its architrave, frieze, and cornice surmounting the shaft and capital. We here present representations of the three orders of pure Grecian architecture, showing the respective proportions of each; but omitting the entablature by which the capitals are always surmounted.



DORIC. IONIC. CORINTHIAN.

The *Doric*, which is considered as massy and robust, derived its name from the ancient Dorians, who inhabited the Grecian district of Doris. The *Ionic* order is more slender, in proportion to its height; than the Doric, and more graceful in its appearance. The Volute, or ram's-horn scroll, is its distinguishing characteristic. It originated from the Ionians, who were Grecian colonists. The *Corinthian* order, of which the acanthus leaf is the distinguishing feature, is more slender than the Ionic; and is usually considered the most beautiful, as well as the most florid, of the architectural orders. It had its origin in more recent periods of art at Corinth, one of the most refined and elegant cities of Greece.

A mixture of the Ionic and Corinthian was adopted by the Romans, at a still later period of architectural art, called the *Composite;* but it has never been admitted as a legitimate order; although it has been very generally introduced in modern edifices of a very ornate character.

ORDERS. [BOTANY, *Supplt.*]

ORDNANCE. [NAVY, BRITISH, *Supplt.*]

ORDNANCE BOARD, an important office, established in Pall Mall, for the purpose of managing all matters relating to the artillery, engineers, garrisons, barracks, issuing of arms, ammunition, &c. Its management is under a master-general, to which situation some distinguished military officer is usually appointed; and he is assisted by a lieutenant-general, surveyor-general, clerk of the ordnance, storekeeper, clerk of deliveries, treasurer, secretaries, &c. The salary of the master-general is 3000*l.* per annum, and his secretary has 1000*l.* The master-general, who, in his military character, is commander-in-chief over the artillery and engineers, has, in his civil capacity, the entire control over the whole department.—The *Ordnance Storekeeper* is a civil officer in the artillery, who has the charge of all the stores. Under his jurisdiction there are various officers, such as the deputy commissaries, clerks, &c.; but he alone is responsible to the office of ordnance. (*Military Encyc.*)

OREGON (ix. 131). Since the settlement of the disputed boundaries of this territory, it has assumed some importance as a British colony. But the discovery of gold on the banks of the great Fraser river, during the past year (1858), has opened a new field for the spirit of emigration; and thousands are now rushing towards this newly-discovered El Dorado. Fraser river rises in the country formerly known as New Caledonia, and enters the gulf of Georgia, opposite Vancouver's Island, in lat. 45° N. Forts George, Alexandria, and Langley are situated on its banks.

ORKNEY and SHETLAND, County of (ix. 148–50). According to the census of 1851, the population of these two islands, which constitute a county, was 62,533. Of houses there were 11,334. The area was estimated at 1545 square miles, or 988,873 acres. The population of the chief towns was as follows:—

Kirkwall	parl. 3,451	Lerwick . .	2,904
———	mun. 2,448	Stromness . .	2,055

ORNICHTHYS (Gr. ὄρνις a bird, and ἰχθύς a fish), a genus of fishes, of the family *Triglidæ*. The pectoral fins are large, the caudal fin rounded, and the ventral fins small.

ORNITHICHNITES. [ICHNITES, *Supplt.*]

ORTHOPLOCEÆ (Gr. ὀρθός right, and πλοκή a folding together), a sub-order of Cruciferous plants, comprehending such species as have the cotyledons incumbent, and folded together.

OSTEOLOGY. [SKELETON, xi. 70–79).

OTAHEITE (ix. 176). In 1844 the French took possession of this island, but not without considerable opposition on the part of Queen Pomare and her subjects. In 1847 Otaheite was obliged to submit to the Protectorate of France, with the entire population of the Society Islands.

OTOMACS, the name of a South-American tribe of Indians, living on the banks of the Oronoco and its tributaries in the rudest state of nature. Humboldt describes them as *Geophagists*, or earth-eaters. He found in their huts pyramidally-formed heaps of clay, preserved for the purpose of satisfying the calls of hunger. It was of a fine and unctuous quality, consisting of silica, alumina, and lime. When the waters of the river are low, they live on fish and turtle; but when the rivers swell, and it becomes difficult to procure food, the Otomacs resort to this clay as their common aliment.

OUDE, KINGDOM OF. [HINDUSTAN, *Supplt.*]

OUDINOT, MARSHAL, Duc de Reggio, one of the bravest and most successful of Napoleon's generals. In 1784 he was simply a private soldier in the Medai infantry; and after passing through the various grades of military rank, during the heat of the French revolution, he became, in 1798, a general of division. His services in the field were of the most varied character, and duly appreciated by his illustrious commander. They comprehended the Meuse, the Rhine, the Moselle, Italy, Germany, Sweden, and Holland. Everywhere he fearlessly exposed himself, and his wounds were countless. He received a contusion in the head at Hogueneau; was struck on the leg at Treves; had a ball in the thigh and three sabre wounds on his arm and his neck at Neuberg; was wounded in the breast at Vurenlos; was hit by a ball at Shwitz; and received a bullet in his side at the Beresina. Napoleon created him a marshal in July 1809, and Duc de Reggio in 1810. Joining the Bourbons, after the Restoration, he became a major-general of the royal guard, and commanded the first corps of the army of the Pyrenees in 1823. After the revolution of 1830 he lost his employment. He died in 1847.

OUTLAWRY (ix. 185). By the Common Law Procedure Act, of 1852, outlawry on *mesne process* is abolished; but outlawry on *final process* may still be obtained against a judgment debtor.

OVEÆ, a term applied by Gray to the sub-tribe of the *Bovinæ* and family *Bovidæ*, which comprehends the common sheep and their different species (x. 929–37). Gray enumerates a great variety of genera and species into which this family is divided and subdivided.

OVENS FOR BAKING. [BREAD, iii. 761–3.] The art of properly baking bread, so as to produce it of an agreeable quality, and at a cheap and economical rate, may be considered as one of the

most useful sciences in domestic economy. Many different plans for the baking of bread, intended as improvements on the present systems, have been suggested; but the one lately invented by Hiram Berdam of New York, as described by the 'Tribune,' appears the most deserving of public patronage. By this new style of bakery, 500 barrels of flour can be baked into 100,000 loaves of bread in twenty-four hours. The bread is kneaded by hand in the usual way; but all other parts of the process are carried on by steam-power, for which purpose a sixteen-horse-power engine is used. The saving of labour is estimated at ninety per cent., and the saving of fuel is nearly as great. The oven is kept constantly at the proper baking heat by a self-regulating adjustment. In structure it is twenty feet high, eighteen feet wide, and eight feet in depth. The bread is placed in iron pans or cars of fifteen superficial feet, having floors of fire tiles. There are thirty-two of these cars, which are kept in perpetual motion by an endless chain, taking just half an hour to make the circuit, during which time they take in the bread, and turn it out perfectly baked.

OVULI'NÆ (Lat. *ovum* an egg, or *Ovula*, one of the genera), in conchology, a subfamily of the *Cypræadæ*, or Cowries, of the order *Gasteropoda*. The shells are oviform, smooth, and polished, and the inner lip without teeth.

OWEN, ROBERT, founder of the system known as 'Socialism,' was born at Newtown in Wales, in 1769. He appears, at a very early age, to have evinced those capabilities for teaching, which so pre-eminently distinguished him in his subsequent career. At the age of seven he became a teacher in a school, and at nine was appointed an under-master. At eighteen he entered into partnership in a cotton-mill, where forty workmen were employed. He was extremely prosperous; and rose from one lucrative concern to another, until he became the head of the New Lanark establishment, which supported 2000 inhabitants, and comprehended a farm of 150 acres. The New Lanark Mills were established when Owen was a boy, in 1784, by Arkwright, in conjunction with David Dale of Glasgow, whose daughter eventually became Robert Owen's wife. Owen was then looked upon as an amiable enthusiast, whose ruin was predicted by most practical men; but, contrary to all expectation, in ten years he was enabled to buy out his first partners for 84,000*l*. In the course of four years he and his new partners realized a profit of 150,000*l*.; and he bought them out for 114,000*l*. He was now at liberty fully to introduce, into his large establishment, his own system of 'Socialism,' or a community of goods, where all the wants of the operatives were supplied from the common stock. The establishment was conducted with great order and regularity; and in defiance of Owen's political liberalism and professed infidelity, he was visited by emperors and kings, nobles and prelates, and various leaders of the dissenting interests, for the purpose of taking a lesson from his new code of social polity. But this system, however much to be admired in the abstract, was not destined to survive the superintendence of their enthusiastic founder. In 1824 he undertook to introduce his social system into America; and he purchased, from the Rappites, the colony of New Harmony, which consisted of 30,000 acres of land. For some time it appeared to answer the objects which the benevolent founder had in view; but the system was not destined to be permanent; and here we may quote the opinions of Duke Bernard of Saxe Weimar, who paid a visit to the settlement. He portrays, with great truth, the real character and object of Owen throughout his whole career:—'He looks to nothing less,' said he, 'than to renovate the world, to extirpate all evil, to banish all punishments, to create like views and like wants, and to guard against all conflicts and all hostilities,'—in fact, to accomplish moral impossibilities. Indeed the enthusiasm of his mind, at the latter period of his life, appears to have been tinged with mental hallucinations. He who professed a disbelief in all religious creeds placed the greatest reliance on *spirit-rapping*; and he actually published the pretended conversations he had with Benjamin Franklin and other distinguished men. What is still more extraordinary, while insisting on the reality of these conversations, he contended that the newly-discovered means of holding communion with the illustrious dead, was 'all electricity.' He died in 1858, at the advanced age of 89.

OXALIC ACID (ix. 195). We have already noticed the existence of this acid in various plants; but the quantity thence derived is so small, that for commercial purposes it is comparatively useless. It is therefore now prepared artificially by acting on sugar, treacle, or starch, by nitric acid, through the agency of heat. The filtered liquor is evaporated, and the oxalic acid crystallizes in four-sided prisms, having an acid taste unchangeable in the air, and soluble in fourteen times their weight of water. Oxalic acid is also soluble in alcohol, a fact which is made use of where it has in analysis to be separated from organic substances. It has several applications in the arts, but is rarely employed in medicine. Amongst its uses may be mentioned the bleaching of straw bonnets, and the discharging of certain colours in calico-printing. In combination with potassa it forms a bin-oxalate of potassa, and is used for the removal of ink stains.

OXFORD CLAY, in geology, the term applied to a dark blue tenacious clay found in the oolitic system. It extends along the valley of the Isis in Oxfordshire (whence its name), and also along the Ouse in Huntingdonshire, and the Witham in Lincolnshire. It is also found in a considerable portion of France and Germany. In this clay formation, shells are very numerous; and the bones of the ichthyosaurus sometimes occur. In Lincolnshire it is known as the fen clay. It has there a considerable thickness and expansion. In sinking for water at Boston, the stratum of clay has been penetrated to the extent of 478 feet, at which depth a thin bed of stone was met with.

OXFORD UNIVERSITY (ix. 198-202). This ancient seat of learning, like its twin sister of Cambridge, has been subjected to some important reforms in its general government, discipline, and

educational routine. The Act of Parliament for effecting these changes received the royal assent in August 1854. It provides for the government of the University under the direction of a general Hebdomadal Council, the establishment of private Halls, and the admission of Dissenters. In the latter case no oaths or subscriptions are necessary, except that of allegiance, to any person matriculating. Still an effective check to innovation exists. It is provided that 'if two-thirds of the governing body of any college shall, by writing, under their hand and seal, declare that, in their opinion, such ordinances and regulations will be prejudicial to such college (as a place of learning and education), then the same shall not take place.' Agreeably to the provisions of the Act of Parliament, on the 24th of October the new Hebdomadal Council was elected in the Convocation House. The number of members present was 220; and Doctors Williams, Scott, Hawkins, Gaisford, Jenne, and Symons, as heads of houses, were declared duly elected. On the 20th of March, 1855, a statute was passed, regulating the appointment to the various professorships. On the 23rd the statute prepared by the Hebdomadal Council, respecting private Halls, was duly promulgated. The head of a private Hall is to be a Master of Arts, or other member of Convocation. He is to take part in the instruction, but may have an assistant or tutor, subject to the approval of the Vice-Chancellor. A private Hall may become a public one, if the building is conveyed to the University, and the appointment of the Principal placed in such hands as the University approves.—On the 24th of April a Convocation was held, when the statutes respecting Dissenters, and the modes of taking degrees, were submitted to the House agreeably to the provisions of the new Act. On the proposition of exempting tutors from the duty of instructing their pupils in the thirty-nine Articles, some opposition arose; but it was eventually carried. The proposition which allows Dissenters to withdraw themselves from the Divinity examinations was also carried; and the mode of granting degrees was then determined and finally settled.

OXFORDSHIRE (ix. 202-6). According to the census of 1851, the population of the county was 170,363; of which 85,481 were males, and 84,882 females. Of houses, inhabited and uninhabited, there were 35,718. The area of the county was estimated at 739 square miles, or 472,887 acres, with a population of 231 persons to each square mile. The population of the principal places was as follows:—

Banbury mun.	4,026	Henley-on-Tham.	3,369
——— parl.	8,715	Neithrop . .	4,180
Burford . . .	1,593	Oxford . . .	27,843
Caversham . .	1,752	Rotherfield-Grays . .	1,518
Charlbury . .	1,477	Stokenchurch .	1,492
Chipping Norton	2,932	Thame . . .	2,869
Cuddesden . .	1,542	Watlington . .	1,884
Deddington .	1,543	Witney . .	3,099
Ensham . .	1,941	Woodstock . .	7,983
Headington .	1,653		

OXGANG, in the feudal ages, a plot of as much ground as one ox could plough in a year, usually reckoned at fifteen acres.

P.

PACHYGNA'THUS (Gr. παχὺς thick, and γνάθος the jaw), a genus of fishes, of the family *Blastidæ*, in which the head and jaws are large, the body short, broad, and compressed; and the front teeth very long.

[The Greek word *pachys* (thick) is of very frequent use as a prefix to compound words in zoology, botany, geology, and other departments of science; as *Pachylis*, a genus of Coleopterous insects, of the family Pentatomidæ;—*Pachylobus* (thick-lobed), the edible Safu, a genus of plants, of the order Amyridaceæ;—*Pachyloma* (thick-fringed), a genus of Brazilian shrubs, of the order Melastomaceæ;—*Pachymyæ*, a genus of fossil Conchifera, of the family Mytelidæ, the shell of which is bivalved, very thick, and transversely elongated;—*Pachynema* (having thick filaments), a genus of plants, of the order Dilleniaceæ;—*Pachynemus*, a genus of Coleopterous insects, of the family Lamellicornes,—also a genus of the family Celoniadæ;—*Pachyodon* (having thick teeth), a fossil genus of bivalve shells, of the family Unionidæ, which is found in the lias and oolite formations;—*Pachyotes* (thick-eared), a family of Cheiroptera, or Bats;—*Pachypleurum* (thick-sided), and *Pachypodium* (thick-rooted), are different genera of plants, one belonging to the order Umbellaceæ, and the other to the order Apocynaceæ;—*Pachypterus* (thick-finned), a genus of fishes, of the family Siluridæ;—*Pachyptila* (thick-feathered), a genus of aquatic birds, of the Gull tribe;—*Pachypus* (thick-footed), a genus of Coleopterous insects, of the family Cetoniadæ;—*Pachyrhizus* (thick-rooted), a genus of twining leguminous shrubs, of the sub-order Papilionaceæ;—*Pachyrhyncus* (having thick bills), a genus of birds belonging to the Black-caps;—*Pachysandra* (having thick males, or stamens), a genus of plants, of the order Euphorbiaceæ;—*Pachysoma* (thick-bodied), a genus of Coleopterous insects, of the family Scarabeidæ;—*Pachystoma* (thick-mouthed), a genus of testaceous Mollusca;—*Pachytherium* (a thick wild beast), a genus of quadru-

peds, of the family Megatheridæ;—*Pachyurus* (thick-tailed), a genus of fishes, of the family Murænidæ, in which the body is very slender, and the tail short.]

PAGA'NI, or PAGANS (Lat. *paganus* a countryman), a name given by the early Romans to those who generally resided in villages, but applied by the early Christians to the worshippers of idols, or those who were not of their own community. The Abbot de Fleury attributes the origin of Pagan, as distinguished from Christian, to the period of Constantine, when the public establishment of Christianity took place. When, by the decree of Constantine and his sons, the profane worship of the gods was prohibited in cities, and their temples shut, those who were attached to the old superstition fled to the country, and secretly performed their former sacred rites in the villages. Hence Pagans came to be used for heathens, or for those who were not Christians; as anciently among the Romans those were called Pagani who were not soldiers. (Nuttall's *Archæol. Dicty.*)

PAGING MACHINES, an ingenious contrivance for printing consecutive numbers with regularity and despatch, and extensively used for numbering the pages of ledgers and other account books. The machine consists of a train of wheels with raised numbers on their edges, and an inking apparatus. When the handle or lever of the machine is pressed down, one of these numbers comes in contact with the ink, and then with the paper. On raising the handle of the lever, the number wheels are slightly moved so as to present a new number, which immediately comes in contact with the inking apparatus, and gives an impression to the paper; and this process, of printing number after number, can be carried on to an almost indefinite extent.

PAINTS. The composition of colours for the purposes of art, which shall not change from length of time, or by exposure to the air, has always been considered a great desideratum among painters of every age and nation; and the most skilful chemists at different times have devoted their attention to the subject. At length a Frenchman, by the name of Monsieur Martiny, has succeeded in producing a brilliant and impermeable oil-paint. He dissolves two pounds of caoutchouc in the oil of petroleum, for which purpose the substances are placed in a copper vessel, gradually heated, and occasionally shaken. When the liquefaction is complete, the compound is filtered through a fine cloth, and then put aside in barrels, to be shaken three or four times a day, in order to affect the due admixture of the materials. A German, by the name of Herr Hoffman, has also been manufacturing a dry linseed-oil, by means of borate of manganese. Twelve ounces of white borate of protoxide of manganese, which has been precipitated from a cold solution of the metal, is reduced to powder at an ordinary temperature, in combination with a small portion of linseed-oil of as great age as possible. Twenty-five pints of common linseed-oil are then added, and the mixture placed in a copper or tin boiler, and subjected for two or three days to the heat of a steam bath, care being taken to stir the mixture from time to time. The compound is then set aside to cool, and occasionally stirred. When cold it is placed in vessels in such quantities as to allow of being well shaken before grinding with the colours, so as to obtain complete admixture of the two substances. One advantage of using the borate of protoxide of manganese, as a dryer for linseed-oil, is, that the resulting colour, containing no lead, does not change with time.

PAIXHANS, HENRY JOSEPH, general of artillery in the French army, and celebrated for his great improvements in the construction of projectiles and heavy ordnance, was born at Metz, in 1783. He was educated in the École Polytechnique, and rose by his distinguished merits through the various grades of military rank to that of general. He was a member of the Chamber of Deputies; and was the author of several works on military matters, which are still held in high estimation. He died in 1854.

PALACE COURT (ix. 235). This court, having long existed as a public nuisance, was altogether abolished, along with the Marshalsea Court, by stat. 12 and 13 Vict. c. 101.

PALLIOBRANCHIA'TA (Lat. *pallium* a cloak, and *branchiæ* gills), an order of Mollusca, belonging to the class *Acephalophora*, in which the branchiæ are applied to the internal surface of the lobes of the mantle.

PALLIUM, or PALL, an upper garment anciently worn by the Greeks, as the toga was by the Romans. It was used by the emperors of the Lower Empire; and in the fourth century was given by the Christian emperors to the prelatical dignitaries of the church, as a vestment of distinction and superiority. The ecclesiastical pallium is frequently mentioned by Mediæval writers, and many curious particulars are recorded. At the commencement of the thirteenth century, when papal ascendancy was at its zenith, and when the Holy See derived a large revenue from the sale of these pallia, Pope Gregory XI. issued a decretal which declared that an archbishop could not call a council, bless the chrism, consecrate churches, ordain a clerk, or consecrate a bishop, before he had received his pallium; and that before any archbishop could obtain this sacred vestment, he should swear fidelity to the pope. It was also decreed, that upon the translation of an archbishop he was not to carry away his pall, but apply to the pope for a new one; and that his successor should make no use of the one left behind. By these extortions the papal exchequer was greatly enriched.

PALM-TREES (ix. 254). All writers and travellers speak with enthusiasm on the magnificence and importance of the palm-tree, as it grows, with its natural luxuriance in Eastern climes. 'Its extensive importance' (says Dr. Clarke) 'is one of the most curious subjects to which a traveller can direct his attention. A considerable part of the inhabitants of Egypt, of Arabia and Persia, subsist almost entirely on its fruit (the date). Their camels feed upon the date-stone. From the leaves they make couches, baskets, bags, mats, and brushes; from their branches, cages for

their poultry, and fences for their gardens; from the fibres of the boughs, thread, ropes, and rigging; from the sap is prepared a spirituous liquor, and the body of the tree furnishes fuel.' It was said by Linnæus that the region of palms 'was the first country of the human race, and that man is essentially palmivorous.' In equinoctial South America the palm-trees appear in their greatest magnificence; the palm-groves, as described by Desfontaines, affording a hospitable shade, both to man and animals, in a region which would otherwise, from excessive heat, be intolerable. The palm-tree grows perfectly upright, a noble vertical shaft, rising to an immense height, when the wide-spreading leaves, which are confined to the summit, form an umbrageous rosette, beneath the shade of which the olive, the pomegranate, the almond, the lemon, and the vine, grow in wild luxuriance, all producing the most delicious fruit. For the greater part of a century, the cocoa-nut palm produces annually about 100 of its large nuts; and the Seje palm of the Oronoco sometimes yields 8000 fruits at a crop. The broad-sheathing leaf, or spatha, which incloses the flowers of the date-palm, contains 12,000 flowers; while that of the *Alfonsia amygdalina* contains 207,000; and the individual plant 600,000. The allusions to the palm-tree are very frequent both in the Old and New Testaments. It is there often used symbolically for something noble; thus we are told that 'the righteous shall flourish like a palm-tree.'

PALMBLAD, VILHELM FREDRIK, author of the great 'Biographical Dictionary of Celebrated Swedes,' was born at Lilijestad, in 1788, and died in 1854. He was a distinguished scholar, and the author of several works, which maintain a high standing in his native country.

PALO DI VACA (Span. the *Cow-tree*), one of the loftiest and noblest trees of the Brazilian forests, which grows in Para to upwards of 100 feet in height, and yields a copious supply of milky juice, whence it is called the *Milk* or *Cow-tree*. This juice has all the taste and flavour of common milk, and it mixes readily with tea or coffee, without curding, or undergoing any change. It keeps unaltered for six or seven days in the temperature of 85°. It differs from all the known milky juices of plants, and approaches in obvious properties to animal milk; but differs widely in its chemical composition; there being no cream or caseous matter. When indurated and dried in the sun, it is neither greasy nor resinous, but may be considered as a kind of wax. The Palo di Vaca also bears a delicious edible fruit, which has the flavour of strawberries mixed with cream; and the timber itself is extensively used for ship-building purposes in the Brazilian dock-yards, especially at Para.

PAMPAS, an Indian word signifying an extensive level of country, rich in shrubs and various grasses, but nearly destitute of trees. In South America, especially in the province of Buenos Ayres, they extend for about 1800 miles to the main ridge of the Andes, which separates that territory from Chili. They are extensively covered with luxuriant herbage, which affords subsistence to innumerable herds of horses and cattle; but the inhabitants are little better than savages. These pampas vary in width from 300 to 900 miles; and differ materially in climate; for while at one extremity we find the palm, at the other there is perpetual ice. Sir Francis Head says that the first of these regions is covered with thistles and clover; the second produces long grass; and the third, which reaches the base of the Cordillera, is a grove of low trees and evergreen shrubs. The grass only changes its colour from green to brown. The first of these regions, however, varies with the seasons in a most wonderful manner. 'In winter,' says Sir Francis Head, 'the leaves of the thistles are large and luxuriant, and the whole surface of the country has the rough appearance of a turnip-field. The clover in this season is extremely rich and strong; and the sight of the wild cattle grazing in full liberty on such pasture is very beautiful. In spring, the clover has vanished, the leaves of the thistles have extended along the ground, the country still looks like a rough crop of turnips. In less than a month the change is most extraordinary; the whole region becomes a luxuriant wood of enormous thistles, which have suddenly shot up to a height of ten or eleven feet, and are all in full bloom. The road or path is hemmed in on both sides; the view is completely obstructed; not an animal is to be seen; and the stems of the thistles are so close to each other, and so strong, that, independently of the prickles with which they are armed, they form an impenetrable barrier. The thistles suddenly lose their sap and verdure; their heads droop; the leaves shrink and fade; the stems become black and dead; and they remain rattling with the breeze one against another, until the violence of the pampero or hurricane levels them with the ground, where they rapidly decompose and disappear; the clover rushes up, and the scene is again verdant.'

The *Pampas del Sacramento* are extensive plains, very little explored, which run in a direction nearly north and south, to the eastward of the Andes, through the province of Peru. They contain upwards of 70,000 square miles, and are so level that they have been compared to the ocean, under whose bosom they once indisputably lay. They are covered here and there with forests; and inhabited by different savage races of Indians, among whom the Spaniards had formerly some missionaries.

PANCRA'TIUM (Gr. πᾶν and κράτος, all strength), a violent kind of exercise practised at the Greek games, which combined the arts of wrestling and boxing. It was a most dangerous exercise, and often proved fatal to one or both of the combatants.

PANGIA'CEÆ (Hindust. *pangia*, one of the genera), a natural order of Exogenous plants consisting of trees with polypetalous flowers and alternate leaves. The order comprehends three genera, with several species found in the warmer latitudes of India, but they are all poisonous.

PAPAL STATES (ix. 266–70). According to the census of 1850, the population of the different Legations and Delegations was 3,006,771, and the area was computed at 15,381 square miles. [ROME, *Suppl.*]

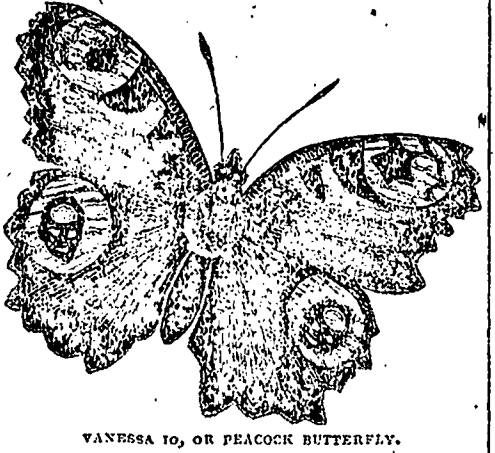
PAPER (ix. 274–6). The Chinese manufac-

ture a filamentous kind of paper, which in England has obtained the name of rice-paper. It is manufactured from a leguminous plant growing in China and India, and is even superior to the ancient papyrus. The stem of the plant is cut into pieces, which are made into one continuous spiral film, on the same principle as the modern mode of veneer cutting. The laminæ, being spread out and pressed flat, form thin sheets, which, after being dyed and properly prepared, constitute the rice-paper of the Chinese.

In the five years, from 1830 to 1844, the manufacture of paper was 31,423 tons; but in a similar period, from 1849 to 1853, it was 67,515 tons; and in the two years 1853 and 1854, it was 79,291 and 79,418 tons. Notwithstanding this increase, the consumption of paper in England, taken according to the population, is considerably less than in other countries. In America, for instance, the consumption is 13 lbs. per head per annum; in France, 9 lbs.; in Belgium and Holland, 8 lbs.; but in England, only 6¾ lbs. to 7 lbs.

PAPIER GLACE (Fr. ice-paper), a very thin and transparent paper, manufactured from the gelatine which is procured from the waste remnants of the skins, bones, tendons, and other gelatinous offal of slaughtered animals. M. Grenet, a Frenchman, was the first to bring this material into use on a large scale, and fabricate many of those beautiful products known as 'gelatine casts,' which have been hitherto manufactured from isinglass at a great expense. The paper is useful for copying drawings, the fabrication of artificial flowers, and the production of an endless variety of ornamented articles. The gelatine is also used as a refining ingredient in clarifying wine, and as a material in the dressing of stuff goods.

PAPILIONIDES (Lat. *papilio* a butterfly), a tribe of Lepidopterous insects, comprehending several families of Diurnal Butterflies,—as the *Papilionidæ*, *Nymphalidæ*, *Satyridæ*, *Erycinidæ*, and *Hesperidæ*. The caterpillars of the first-named family are furnished with a kind of retractile process at the back of the neck. The most elegant species is the *Vanessa Io*, or Peacock Butterfly, which is indeed the prettiest specimen of our native butterflies. Its wings are of the most splendid colours, and variegated with brilliant eyelet spots, which present a beautiful appearance.



VANESSA IO, OR PEACOCK BUTTERFLY.

There are several other very pretty species belonging to the same genus as the Peacock Butterfly, which may be frequently seen sporting about our fields on a fine summer's day, as the *Cynthia Cardui* (Painted Lady Butterfly), the *Vanessa Atalanta* (Red Admiral), the *V. urticæ* (Tortoise-shell Butterfly), &c. Still the *Vanessa Io*, of which we have given an engraving, may be considered as the most beautiful of the papilionaceous family.

PAPY'RUS (ix. 283). The history of papyri, and the materials of which they were formed, may be said to embody the history of ancient literature. Its earliest manufacture is traced to the Egyptians. It was known even in the time of Homer; but it was not until the conquests of Alexander that it began to be manufactured with that perfection which art always adds to nature. There were several cities of Egypt where its manufacture was carried on; but the most celebrated place was Alexandria. It is a curious fact, however, that while the ancient Egyptians turned the papyrus plant to a variety of uses, making boats and roofs of the stem, sails of the bark, fuel of the roots, and clothes and ropes of the fibres, there is not at present a single specimen of the plant to be found in that country. M. de Sauley informs us, however, that it grows abundantly on the banks of a rivulet in Judæa, between Jaffa and Kaisarich.

The papyrus of the Greeks and Romans was indisputably derived from the Egyptians; Pliny, Varro, and other Roman writers have entered largely upon the subject. But the extensive discoveries of papyri, among the ruins of Herculaneum, during the last and present centuries, have added materially to our knowledge, especially as regards the ancient manuscripts with which those papyri were covered. In 1753 a vast number of these literary treasures were found in a suburban villa of Herculaneum. Canonico Iorio entered into a close examination of these papyri, and in 1825 published the results; from which it appeared that 1760 of them had been rescued from the ruins, independently of a vast number destroyed by the workmen. The papyri were found, according to Iorio, ranged in presses or shelves round the sides of the room, while, in the centre of the floor, stood a species of insulated rectangular column of books fronting every way, not much unlike those which are frequently found, of a circular form, in the drawing-rooms of ladies in England. Some of the manuscripts were opened with so much difficulty, that it was found absolutely necessary to destroy the visible column, after having most carefully copied it, in order to arrive at the next. Of the papyri, 371 were entire; 61 were nearly perfect; 161 wanted about one-third of each roll. Of fragments, 1324 were found; and of those which had only the exterior perfect, 474 were discovered. Among the works now known to exist in this singular collection were the following, both in Greek and Latin (the names of which are taken from the account of the Canonico Iorio):—Demetrius, de Geometria, de

Poematis—In Polyeni Difficultates—Epicuri, de Natura, lib. ii. xx.—Colotis in Lysidem Platonis —Polystrati de Temerario Contemptu—Philodemi de Religione, de Moribus, de Epicuro, de Morte, de Vitiis, &c.—Carnisci Amicabilia—Crisippi de Providentia—Epicuri de Natura, &c.

Papyrus was gradually superseded, about the tenth century, by the manufacture of cotton reduced to a pulp,—a method known in China for ages before. This composition, from its being adapted to the same purposes as papyrus, received the general appellation of *paper*, of which the Abbé L'Andres gives the best account. The Chinese and Asiatic Orientals made silk paper, the use of which passed, A.D. 652, into Persia; and A.D. 706, to Mecca. The Arabians substituted cotton, which passed into Africa and Spain, where flax being grown, linen rags were substituted instead of cotton, because the latter was only to be obtained by importation. From hence linen paper passed into France, Germany, and England. After the Arabs had introduced paper, papyrus began to lose its commercial value. Nevertheless the competition between the two was vigorously maintained, until it was discovered, in the twelfth century, that oakum and the refuse of flax and hemp could be manufactured into paper. At length the conversion of rags into that useful substance superseded every other kind of material for writing and printing purposes.

PARCHMENT-PAPER. It has been discovered that paper, by being momentarily immersed in diluted sulphuric acid, and then well washed, first in water, and then in weak ammonia, becomes as tenacious as parchment; and if a slip of it be tested after this process, it will bear ten or twelve times the ordinary weight of paper.

PARENT AND CHILD (ix. 300–302). According to stat. 20 and 21 Vict. c. 55, the burden of supporting children convicted of crime, who may be placed under a course of reformatory training, now devolves entirely on the parent. [REFORMATORIES, *Supplt.*]

PA'RIAN MARBLE, a beautiful white marble obtained from the isle of Paros, and used by the Greeks in their finest statuary.

PA'RIAN PORCELAIN, the name of a very fine and beautiful variety of porcelain, which successfully imitates the more delicate kinds of marble employed in statuary. The skill of some of our best sculptors, moulders, and artists are engaged in its production. Of the ingredients of the material, nearly two-thirds are silica or flint, and the rest consists of alumina or clay, with small portions of potash, soda, magnesia, and lime. This mixture is not used in the state of clay, but as a liquid, which is like plaster of Paris in a fluid state. It is poured into the mould, and the solidified portion is baked, until it assumes that fineness of texture for which it is distinguished. The mould is then taken to pieces, and the cast liberated. As different moulds are required for the different parts of a figure, considerable care and artistic skill are required to make the respective parts properly harmonize, and produce a perfect *tout-ensemble*.

PARIS (ix. 307–12). According to the last quinquennial census of Paris, the population exceeds 1,200,000 souls within the walls, and 1,800,000 within the fortifications. A return has been made of the increase of population within the last quarter of a century, in the different communes around Paris. Thus at Batignolles, the number of inhabitants in 1831 was 6826; 1836, 11,566; 1841, 14,073; 1846, 19,864; 1851, 28,762; and in 1856, 44,094. At Belleville, there were 8109; 10,698; 19,515; 27,801; 34,915; 57,699 respectively. Boulogne, 5,323; 5,993; 6,906; 7,847; 7,602; 11,378. La Chapelle, 2,440; 4,177; 8,724; 14,398; 18,700; 33,449. Montmartre, 4,571; 6,812; 7,802; 14,710; 23,112; 36,450. Neuilly, 5,599; 7,654; 9,493; 13,063; 15,897; 23,822. La Villette, 4,938; 7,681; 10,954; 13,485; 13,651; 30,287.

Connected with the social organization of Paris, in 1856, there were 9 ministers; 48 Catholic parishes; 3 Calvinist churches; 2 Lutheran; 2 Reformed; 3 Anglican; 2 Synagogues; 5 Lyceums; 2 Municipal Colleges; 1 Communal ditto; 2 Private ditto; 4 Special Schools under the protection of Government; 129 Communal Schools; 37 Infant ditto; 13 *Crèches* (Public Nurseries); 1 Savings Bank; 1 Caisse des Rétraites (Superannuation Fund); 369 Workmen's Benefit Societies; 22 Theatres; 3 Circuses and Hippodromes; 189 Public Ball-rooms.

Since the accession of the present emperor, Paris has undergone immense improvements, especially in the neighbourhoods of the Tuileries, the Boulevards, and the Rue Rivoli,—vast numbers of old streets and dilapidated buildings having been removed for the erection of more open and commodious thoroughfares. On the 5th of April, 1858, the Boulevard Sebastopol was opened with great pomp. It is an immense work, and will prove of great advantage to the capital, not only as a noble and commodious thoroughfare, but from its having caused the removal of a great number of close and unhealthy streets.

The entire yearly manufactures of Paris are estimated at a value of 5,160,000*l.*; of which 172,000*l.* are of children's toys.

PARIS, DR. JOHN AYRTON, F.R.S., D.C.L., and President of the Royal College of Physicians, was born at Cambridge in 1785. At that University he was educated, and went through the different grades of literary distinction with considerable *éclat*. Having graduated as M.D. he first commenced practice as a physician in London; but afterwards settled in Penzance, as successor to Dr. Borlase, where he founded the Royal Geological Society of that county, which is one of the oldest in the kingdom. On his return to London he delivered a course of lectures on the Materia Medica, at the Windmill School of Medicine, and also gave a course on the philosophy of Medicine at the Royal College of Physicians. On the death of Sir Henry Halford, in 1844, he was elected president of the College; and this honourable position he retained till his death, which took place in 1856.

Dr. Paris was the author of several works which are still held in some estimation; among others, a 'Guide to Mount's Bay and the Land's End;'

'On the Soils of Cornwall;' 'Life of Sir Humphrey Davy;' and 'Philosophy in Sport made Science in Earnest.'

PARLIAMENT (ix. 317–30). By stat. 21 and 22 Victoria it was enacted that the property qualification of members of the House of Commons should be altogether abolished. An Act has also been passed for legalizing the payment by a candidate of the travelling expenses of the voters.

Connected with Parliamentary business, and more especially with the House of Commons, there are many important functionaries. The House of Lords furnishes no detailed statement of the staff employed, for they are all paid out of a fee-fund which is managed by the House itself, and does not appear in the public accounts, with the exception of the chairman of committees, who has 2500*l.* per annum; his counsel, who has 1500*l.*; and the serjeant-at-arms, whose salary is 1500*l.* The principal functionary of the House of Commons is the Speaker, who is elected at the commencement of every Parliament. He has a salary of 5000*l.* a year, and a handsome official residence. The Chairman of Committees of the whole House is also elected by the members, at the opening of each Parliament. He enjoys a salary of 1500*l.* per annum. The Clerk of the House of Commons is appointed for life by letters patent from the crown. He has a salary of 2000*l.* a year, and an official residence. His duty is to keep the Journals of the House, and take the general charge of its official business. The duties of the Sergeant-at-arms are to preserve order, and to arrest and keep in custody all persons committed to his charge by warrant from the House. His salary is 1200*l.* per annum. Each of these officers has the appointment of various clerks and officers; many of whom have very handsome salaries. The counsel to the Speaker has 1500*l.*; the principal Clerk-assistant, 1750*l.*; the second clerk, 1250*l.*; the chief librarian, 1000*l.*; the deputy sergeant-at-arms, 800*l.*; his assistant, 500*l.*; the principal door-keeper, 300*l.*; the second door-keeper, 200*l.*; besides numerous clerks, messengers, and subordinate officials.

PARRY, ADMIRAL SIR WILLIAM EDWARD, the celebrated Arctic navigator, was the fourth son of Dr. C. H. Parry of Bath, and was born in 1790. He entered the navy in 1803 on board the *Ville de Paris*, 110, and received his commission as lieutenant in 1810. After being engaged in active service, especially against the Americans, he received a commission, in 1818, to join Sir John Ross's expedition, as lieutenant in command of the *Alexander* brig. On the failure of that undertaking the Admiralty ordered a second expedition to be equipped, which was entrusted to Parry; and to the success attending this voyage his early fame may be attributed. The two ships were the *Hecla* and the *Griper*, which left the Thames on the 11th of May, 1819, and reached Melville Island at the beginning of September. Having thus crossed the meridian of 110° W., in lat. 74° 44′, he became entitled to the reward of 5000*l.*, which had been offered by parliament to those who should succeed in penetrating so far westward within the Arctic circle. The expedition wintered at Melville Island, and re-entered the Thames in November 1820. The gallant commander was received with every public demonstration of honour, and promoted to the rank of commander. In 1820 he was commissioned to take charge of the *Fury* bomb, in company with the *Hecla*, commanded by Captain Lyon. This expedition extended over the years 1821–3, and underwent great hardships; but the vessels eventually returned in safety. The same ships were afterwards refitted for another Arctic voyage, upon which they sailed from the Thames on May 8, 1824; the *Hecla* commanded by Captain Parry, and the *Fury* by Captain H. P. Hoppner. The following winter was passed at Port Bowen, in Prince Regent's inlet, where the two vessels remained from Sept. 28, 1824, until July 20, 1828. The *Fury* was shortly afterwards wrecked, and the *Hecla* reached England in the following October with a double ship's company. Shortly afterwards Captain Parry was appointed Hydrographer to the Admiralty. Having proposed and obtained sanction to a plan for reaching the North Pole by means of sledges from the northern shores of Spitzbergen, he was again appointed to the *Hecla*. After great labour and danger this expedition attained the latitude of 82° 45′, which is the nearest point to the North Pole that has been reached. He retraced his steps to the *Hecla*, which he brought home, and paid off, Nov. 1, 1827. This terminated Parry's long and arduous services in the Arctic regions.

In 1837 Captain Parry was appointed to organize the Packet Service, then transferred to the Admiralty; and from April the 19th, 1837, to December 1846, he was Comptroller of the Steam Department of the Navy. He afterwards held the office of Captain Superintendant of Haslar Hospital, and more recently that of Governor of Greenwich Hospital, which he held at the time of his decease. In 1852 he attained the rank of Rear-Admiral. He died in 1855.

[The spirit of Arctic exploration did not expire with the attempts of the gallant Parry. In 1845 the British Government sent out an expedition under the command of Sir John Franklin, consisting of the *Erebus* and *Terror*. Unfortunately the parties, after passing Lancaster Sound, were never again heard of. But, among the different expeditions which were sent out in search of Sir John and his gallant crew, one was at length successful in discovering the long sought-for North West Passage. Captain M'Clure, of the *Investigator*, entered Bhering's Straits in August 1850, and sailed eastward until he reached Baring Island and Prince of Wales' Strait. Here he was frozen in; and during the winter the exploring parties discovered that the Prince of Wales' Strait opened into Barrow Strait, which had been previously entered from the west; and thus the important problem of the North-west Passage, although it may never lead to any useful results in a commercial or geographical point of view, was satisfactorily solved. The North side of Baring Island was discovered to be the Banks' Land which Captain Parry saw from Melville Island in 1819.

Captain M'Clure made great exertions to pass

out of Prince of Wales' Strait into Barrow Strait; but he was baffled by strong winds and ponderous masses of ice. He, however, succeeded in rounding nearly the whole of Baring Island, and on Sept. 24, 1851, entered Mercy Bay,—a station situated on the northern side of Baring Island, in latitude 74° 6′ north, and longitude 117° 54′ west, and on the south side of Barrow Strait. Thus was effected the discovery of a second North West Passage. Mercy Bay is about sixty miles south of Melville Island; and in April 1853, a few days before Captain M'Clure had made arrangements for deserting his frozen-up ship, a party of Captain Kellet's officers, from Melville Island, opened communication with the gallant officer. In the spring of 1855, Captain M'Clure abandoned the *Investigator;* but he and his crew were brought to England by the vessels belonging to the expedition under Sir Edward Belcher.]

PASCHITES, the name of a Christian sect of the second century, who celebrated the feast of Easter on the 14th day of the moon, on whatever day of the week it happened, in imitation of the Jews. But in a council held at Rome, A.D. 196, pope Victor excommunicated those who celebrated Easter on any other day than Sunday; and the dispute was finally settled, at the council of Nice, in 325, by the time of Easter being fixed as at present observed.

PASKIEWITSCH, PRINCE IVAN FEDOROWITCH, the celebrated Russian commander, was born at Pultawa, of a noble and wealthy family, in 1782. He commenced his military career in 1805, and was for some years actively engaged against the French. But it was not till 1827, that he became distinguished as a military commander. In the war between Russia and Persia, in 1826–8, he succeeded General Yermoloff in the chief command. Penetrating into the Persian territories, he captured several fortresses, defeated Prince Abbas Mirza, took possession of Erivan and Tauris, and by the rapidity of his successes forced the Shah of Persia to sue for peace, which was signed in February 1828. He was then raised by the Emperor to the dignity of a count of the empire, and received the surname of Erivan, with a present of a million of roubles. For his successes against the Turks, when he captured Kars and Erzeroum, the emperor raised him to the rank of Field-Marshal. His next command of importance was against the Poles, when he succeeded in capturing Warsaw, and defeating that heroic people. He was then raised to the dignity of Prince of Warsaw, and created Viceroy of the kingdom of Poland, with the title of Highness. He was afterwards engaged in the war against the Hungarians in 1849; and in 1853 he was at the siege of Silistria, when he received a contusion, which compelled him to retire from the service. He died in 1856.

PASSPORTS (ix. 350). After the attempt on the life of the Emperor of the French by Orsini and his colleagues, the passport system was extremely rigid. Formerly the consular officers of France were in the habit of granting passports to Englishmen about to travel on the Continent; but afterwards their authority only extended to the granting of them to French subjects. This necessitated an entire change in our own system. British subjects must now obtain passports from the Foreign Office, which they are enabled to do on producing a recommendation from any banking firm, mayor, magistrate, justice of the peace, clergyman, or established professional man. The charge for the issue of each passport is 6*s.*, including 5*s.* for stamp duty. The passports are issued daily between 11 and 4 o'clock, and must be *viséd* by the agent of the country to which the bearer is destined. Applications may be made by post, when the passports are usually returned the next day. But the system of repeated *visas having* been found extremely troublesome, the French government now dispenses with the necessity of the passports being *viséd* at each journey, as the regulation of Jan. 1858 required; and the traveller is thus exempted for the space of one year from the date of the first *visa*.

PASTIC'CIO (Ital.), a species of opera, the music of which is selected from various composers, and the words written to the melodies, instead of the melodies being composed to the words,—a practice which has long been adopted both in Italy and England.

PASTORA'LE, a term applied in music to soft rural movements, generally written in twelve quavers, and moving by alternate crotchets and quavers. (Busby.)

PATENTS, LAW OF (ix. 357). By stat. 15 and 16 Vict. c. 83, the laws respecting patents have been much simplified, and the expenses materially reduced. A register has been established, in which all particulars must be entered, and remain open to public inspection. A single patent, moreover, is now sufficient for the United Kingdom.

PAUPERISM. [Poor Laws, *Supplt.*]

PAWNBROKERS (ix. 372). The non-liability of pawnbrokers, in cases of accident by fire, has been decided in the Court of Queen's Bench. Such was the uncertainty of the law, that in a recent case of fire, where some pledged goods had been injured or destroyed, a magistrate made an order against a pawnbroker; but, on an appeal to the Court of Queen's Bench, the decision was reversed; and it was held that a pawnbroker is not an insurer against accident, but is only to make good any damage when it results from his own neglect or wilful misconduct, or that of his servants.

PEC'TOLITE (Gr. πηκτὸς concrete, and λίθος a stone), a mineral found in South Tyrol, of a greyish colour, which occurs in spherical masses of a columnar structure. Its specific gravity is 2·69; its hardness, 4·5; its constituents, silica, lime, soda, and potash, with a small portion of alumina and oxide of iron.

PECULIARS, COURT OF. [Probate, Court of, *Supplt.*]

PEEBLESSHIRE, Scotland (ix. 383–5). According to the census of 1851, the population of the county was 10,738; inhabited houses, 1796; area, 354 square miles, or 226,488 acres, about one-third arable, and two-fifths under grass.

Peebles is the county town, the population of which is 1982; of the parish 2673.

PEEL, SIR ROBERT, a distinguished statesman, and premier of England, was the son of the first baronet, Sir R. Peel, and born near Bury, in Lancashire, in 1788. He was first educated at Harrow, and afterwards at Oxford; at both of which places he was distinguished for his assiduous habits and scholar-like attainments. At the university he was honoured, both in classics and mathematics, with a first-class degree. On the completion of his education, in 1809, he was returned to Parliament as member for Cashel. He soon gave proofs of his great abilities as a statesman and an orator, and in 1811 was appointed Under-Secretary of State for the Colonies under the administration of Mr. Perceval. In 1812 he received the appointment of Secretary for Ireland. In 1817 he was unanimously returned as representative of the University of Oxford. In 1819 he was elected chairman of the committee on the currency, the result of which was the passing of an Act the same session for legalizing the return to cash payments; and with that important measure the name of Sir Robert Peel is historically identified. In 1822, on the retirement of Lord Sidmouth, Mr. Peel became Secretary of State for the Home Department. In 1826 he brought forward and carried his important measure for the reform of the criminal code. On the accession of Canning to the premiership, in 1827, he declined to take office under that minister, because he considered the premier as pledged to the demands of the Roman Catholics, to which he himself was strongly opposed. In 1828, however, he returned to office as Home Secretary under the administration of the Duke of Wellington. Then it was that the Roman Catholics and their Protestant advocates finally defeated all attempts to restrain their agitation. After the discussions in the two Houses of Parliament on the Catholic question in the session of 1828, frequent communications took place between the Duke of Wellington and Mr. Peel respecting the state of that question, and each of them came to the conclusion that it could not safely be left in the position in which it had stood for so many years; consequently he moved the Relief Bill in the House of Commons on March 5, 1829. Having announced, in a long letter to the Chancellor of the University of Oxford, the reasons of his change of opinion, and the consequent resignation of his seat, Mr. Peel's re-election was opposed, and Sir Robert Harry Inglis was returned in his place by a majority of 146.

Mr. Peel re-entered the House of Commons as member for Westbury; and it was in that capacity that he proposed the Catholic Relief Bill, which received the royal assent April 18, 1829.

On May 3, 1830, Mr. Peel succeeded his father in the dignity of a baronet, and also as member for Tamworth, which he continued to represent in Parliament until his decease.

On Nov. 15, 1830, the administration were in a minority of twenty-nine in the House of Commons, on the Civil List; and on the following day the House of Commons was informed by Sir Robert Peel that he and his colleagues had resigned office.

Parliamentary Reform was one of the great changes of the time, in which Peel had no share. It was carried by his rivals, the Whigs, in spite of all the efforts he could make to oppose it.

The death of Earl Spencer, in 1834, having afforded the King a pretext for dismissing his Whig ministers, Sir Robert Peel was summoned from Rome, and requested to form an administration. But his position in the House was not yet sufficiently strong to enable him to retain his place; and the Government, being beaten on more than one question, on April the 8th, 1835, they resigned, and the Whigs once more returned to office. In 1839 he was again Prime Minister for a still shorter period, the famous 'Bed-Chamber plot,' as it was called, having compelled him to relinquish the reins almost as soon as he had grasped them.

In the summer of 1841, Sir Robert Peel led on an attack which ended in the resignation of Lord Melbourne, and placed him once more at the head of affairs. In 1842 he proposed one of the most extensive alterations in the tariff of the country that had ever been effected. Hundreds of imposts —many of them insignificant, but all of them vexatious—were swept away. The corn-laws were abolished in June 1846, and free trade proclaimed as the commercial policy of the country. Simultaneously with the passing of this measure, Sir Robert Peel resigned office; a coalition of Whigs and Protectionists having defeated him on the Irish Coercion Bill. From that period he gave a general support to the Whigs, declaring that he had no wish to resume office.

Sir Robert Peel died by a fall from his horse in 1850; but such was the universal respect for his memory and his great political services, that the House of Commons carried a unanimous address to the Crown for the erection of a monument to his honour in the Collegiate Church of Westminster. A peerage was offered to Lady Peel; but this she declined, in deference to the expressed wishes of her lamented husband. Besides the monument voted by Parliament, general subscriptions were set on foot throughout the country for several public monuments to commemorate the genius and the deeds of this illustrious statesman.

PEGU (ix. 387). In 1850 this province of the Birman empire was annexed to our Anglo-Indian possessions by proclamation of the Governor General. It includes the districts of Rangoon, Prome, Bassein, Henzadu, Toungoo, and Tharawaddy, which contain a population of 570,180; with an area of 32,300 square miles.

PEKIN (ix. 388). In the spring of 1858 the capital of the Chinese empire was the scene of some important events. Soon after the capture of Canton [CHINA, *Supplt.*], the united English and French squadrons proceeded to the Peiho River, for the purpose of attacking Pekin, or otherwise compelling his celestial majesty to enter into a treaty of peace and commerce. Lord Elgin, on the part of Great Britain, and Baron Gros, on behalf of France, entered the river, and proceeded to attack the forts of Tien-Tsin, which are situated

at a short distance from Pekin, and guard the entrance of the river to that city. The forts having been captured and destroyed, the imperial government was soon reduced to submission, and appointed commissioners to enter into treaty with the united plenipotentiaries of England and France. The preliminaries were soon settled; and on the 26th of June, 1858, a treaty was duly signed, the principal provisions of which, on the part of China and Great Britain, were to the following effect:—The appointment of ambassadors, ministers, and other diplomatic agents, on the part of either country, at the courts of Pekin and St. James:—The permanent establishment of a British minister, his family, and suite, at Pekin:—Consuls to be appointed to reside in China, and to reside in any of the open ports:—The Christian religion, as professed by Protestants or Roman Catholics, to be tolerated, and its professors protected:—British subjects to travel for pleasure or trade into all parts of the interior, with passports from their consuls, countersigned by the local authorities:—British merchant ships to be allowed to trade up the great river (Yang-tsz); and, in addition to the present open ports, New Chwang, Tang Chow, Tar Wan (Formosa), Chow Chow (Swatow), and Kiung-Chow (Hainan), to be opened, and the right of residence and holding landed property to be conceded:—All questions in regard to rights of property or person between British subjects to be subject to the jurisdiction of the British authorities:—The tariff fixed by Article 10 of the Treaty of Nankin to be revised by a commission of British and Chinese officers:—British merchant vessels to be at liberty to engage pilots to take them into any of the open ports, and to convey them out, after they have discharged all legal dues and duties:—British merchant vessels not to resort to other than the ports declared open; nor unlawfully to enter ports, or to carry on clandestine trade along the coasts:—All official communications, addressed by British diplomatic or consular agents to the Chinese authorities, to be henceforth written in English:—The character 'I' (barbarian) not to be applied to the British Government, or to British subjects, in any Chinese official document issued by the Chinese authorities:—British ships of war, coming for no hostile purpose, or being engaged in the pursuit of pirates, to be at liberty to visit all the Chinese ports, and to receive every facility for procuring necessaries, or, if required, for making repairs; the commanders of such ships to hold intercourse with the Chinese authorities on terms of equality and courtesy. Article 54 confirms all advantages secured to the British Government by previous treaties, and stipulates that the British Government shall participate in any advantages which may be granted by the Emperor of China to any other nation.

A separate Article provides that a sum of two millions of taels, on account of the losses sustained by British subjects through the misconduct of the Chinese authorities at Canton, and a further sum of two millions of taels, on account of the expenses of the war, shall be paid to the British representative in China by the authorities of the Kwang Tung province.

Thus at length has the most ancient, the proudest, and the most populous empire on the globe, been compelled to renounce its exclusiveness, and open itself to the progressive civilization of the western world. The four great nations of the earth (England, France, Russia, and America) each took part in the accomplishment of this important event, and each has obtained its separate treaty.

The Russian mission, now at Pekin (1858), has made known the result of the last census taken by the order of the Emperor of China. The present population is said, by this document, to amount to 415,000,000 (that of Pekin being about 1,948,115).

PELLICO, SILVIO, the celebrated Italian scholar and patriot, was born at Saluzzo, in Piedmont, in 1789. Having settled at Milan, he published, in 1819, his magnificent tragedy of 'Francesca da Rimini,' and during the same year he translated Lord Byron's 'Manfred.' After this he entered into the arena of politics, and set up a liberal journal called 'The Liberator,' in which he was intent on rousing Italy to her regeneration. The Journal was suppressed by the Austrian authorities; and he was soon afterwards arrested and tried for conspiracy against the government. He was condemned to death; but the sentence was commuted to fifteen years' close imprisonment at Spielberg in Moravia; and the horrors of that imprisonment are forcibly recorded in 'Le Mie Prigioni,' which has been translated into almost every European language. He regained his freedom in 1830; and in 1832 his work was translated into English by Roscoe. On his release he settled in Turin, and was employed as librarian to the Marchesa Barola to the time of his death, which took place in 1854. He was the author of several tragedies; and one of his latest works was a treatise 'On the Duties of Men' ('Dei Doveri degli Uomini').

PEMBROKESHIRE, SOUTH WALES (ix. 401-4). According to the census of 1851, the population of the county was 94,140; inhabited houses, 19,136; area, 628 square miles, or 401,691 acres, of which about 140,000 are arable. The population of the principal places was as follows:—

Fishguard . .	1,757	Pembroke Dis.	10,700
Haverford west b.	6,580	St. Davids . .	2,460
——————Dis.	9,729	Tenby . . .	2,952
Narbeth . . .	2,822	Wiston . . .	774
Pembroke bor.	10,107		

PENÆA'CEÆ (from the genus *Penæa*, so called in honour of P. Pena), a natural order of Endogenous plants, natives of the Cape of Good Hope. They consist of shrubs with imbricated leaves, red flowers, and capsular fruit.

PENNIES, or PENCE, the most general and most ancient of our copper coinage. The penny originally weighed an ounce; but does not at present maintain that standard; copper money being coined in the proportion of twenty-four pence to the pound avoirdupois. It is not a legal tender for more than one shilling. For the convenience of petty traders, and the smaller transactions of business, the copper coinage is divided into

pennies, half-pennies, and farthings; of which the penny is the principal. During the seven years ending 1854, 37¼ tons of copper were coined into about 39¼ million pieces, chiefly manufactured at Birmingham. The following is an enumeration of the number of pennies coined from 1848 to 1854 inclusive—

1848. .	161,280	1852. .	263,424
1849. .	268,800	1853. .	1,021,440
1851. .	268,800	1854. .	6,827,520

In our monetary history we find that the penny was first composed of silver, and weighed the 240th part of a pound. It was minted with a deep cross; when broken into two parts, each was called a halfpenny; and when into four, each portion was called a *fourthing*, or farthing. It was gradually diminished in size and weight till the time of Elizabeth, when its value was reduced to the 62nd part of an ounce.

PENSIONS (ix. 417-19). In the army certain pensions are allowed to officers and soldiers, as rewards for good services, or when they are disqualified from further duty. The pensions to soldiers are paid from Chelsea Hospital, the men being in or out pensioners. [CHELSEA HOSPITAL, *Suppl.*] Pensions are allowed to the widows of officers according to the following scale:—to the widow of a general officer, 120*l.*; of a colonel, 90*l.*; of a lieut.-colonel, 80*l.*; of a major, 70*l.*; of captains, paymasters and physicians, 50*l.*; of surgeons, 45*l.*; of lieutenants, adjutants, assistant-surgeons and apothecaries, 40*l.*; of second-lieutenants, cornets, ensigns, and quartermasters, 36*l.*; of regimental chaplains, veterinary-surgeons, hospital-assistants, hospital mates, and deputy-purveyors, 30*l.*; of the chaplain-general, 90*l.*; of chaplains to the forces, district-paymasters, and provost-marshals, 50*l.* (*Military Encycl.*)

PENTACRI'NUS (Gr. πέντε five, and κρίνον a lily), in geology, a genus of Encrinites, which have pentagonal ossiculæ. Extensive beds of limestone are sometimes found composed of these crinoidal or pentacrinoidal remains, which are sometimes worked for chimney-pieces, and other ornamental purposes. Thus, for immeasurable ages before the existence of the human race, the component parts of the material of our variegated slabs were once instinct with animal life. The *Pentacrinus Caput-Medusæ* is a very rare crinoidal animal, which is now the chief living representative of those mighty swarms that were among the primæval inhabitants of the ocean, whose fossilized remains form a vast extent of strata in America and the north of Europe. It is formed of a column of numerous pentagonal joints, and is still found at the bottom of the seas of the Antilles.

PENTACTEÆ, in zoology, a sub-family of the Echinodermata, belonging to the class Radiata. It comprehends the three genera, *Cucumaria* (sometimes called Sea-cucumbers), the *Psolinus*, and the *Ocnus*.

PENTATH'LUM, an ancient exercise performed at the Grecian games, which was a combination of five others, viz. running, leaping, hurling the javelin, throwing the quoit, and wrestling and boxing. If any one person happened to be victor in all these, he received a crown of great value, and was rewarded with public honours.

PERCUSSION LOCK, a newly-invented lock for fire-arms, in which the gunpowder is exploded by fire arising from the percussion of fulminating powder, which is contained in a small copper vessel, called a *percussion cap*. The principle of percussion locks is, that a small copper cap or thimble, filled with a detonating powder (nitrate of silver), is placed on the nipple of the touch-hole, and forcibly struck with the hammer of the lock when the trigger is pulled. The detonating material being thus ignited, instantaneously communicates the ignition to the gunpowder in the interior of the musket or rifle. Thus the old system of lock and flint is entirely superseded by the use of percussion caps, which in our late military contests in the East have been found most effective.

PERFUME (Fr. *parfum*), a substance which exhales an agreeable odour or scent. But it is remarkable that some of our most exquisite perfumes, instead of being distilled from flowers, as of old, are obtained by processes of chemical amalgamation from the most fetid or nauseating substances. Thus the fragrant *eau de mille fleurs* is manufactured from the refuse drainings of the cow-houses. The *oil of pine-apples* is the production of putrid cheese and sugar; and the *oil of bitter almonds* is obtained from gas-tar and aquafortis. But what is still more wonderful, there is a peculiarly fetid oil, which is formed during the manufacture of whisky and brandy, generally called fusil-oil; yet from this *stinking* material is produced, by a chemical mode of treatment, the sweet-scented *oil of pears*; and by other processes are obtained those fragrant essences, the *oil of cognac*, *the oil of grapes*, and the *oil of apples*. Although these perfumes are not produced from the fruits and flowers after which they are named, still they are almost identically the same, in chemical composition, with the original perfumes; the ingenuity of man effecting in one case, by chemical combinations, what nature does in the other.

PERIB'OLUS (Gr. περὶ around, and βολὴ throwing), in zoology, a genus of gasteropods found by Adanson on young cowries, the outer lips of whose shells are trenchant. (Craig.) The term is also applied, in architecture, to the court or inclosure which surrounds a temple.

[The Greek word *peri* (about, or around) is of very general occurrence as a prefix to terms of science or art; as *Pericardium* (around the heart), the membranous sacs which surround the heart; —*Pericarp* (around the seed), the seed-vessel of a plant,—*Pericera* (encircled with horn), a genus of Crustaceans, of the family Brachyura;—*Pericranium* (around the skull), the fibrous membrane which envelopes the skull;—*Perilampus* (shedding light around), a genus of Hymenopterous insects, of the family Chalcidites;—*Peristaltic*, a term applied to the vermicular motion of the animal intestines, by which the chyle is propelled into the orifices of the lacteal vessels, and the alimentary functions promoted;—*Peristyle* (surrounding columns), in architecture, a term applied to the range of columns in a peristylium or square

court surrounded by pillars;—*Peritrochium* (a surrounding wheel), in mechanics, a wheel, or circle concentric with the base of a cylinder;—with numerous other similar terms, which the genius of science and art is perpetually introducing into our language.]

PERIODICAL LITERATURE. The progressive strides made in this important department of the British press, within a very few years, may be ranked among the most wonderful phenomena of our social polity. At the commencement of the present century this species of literature was almost exclusively confined to the more expensive kinds of newspapers and magazines. Few of the former were published at less than sevenpence, nine-pence, or one shilling; the daily papers then consisting of four small pages, printed very slowly at a common hand-press. At length a number of serials, consisting chiefly of miscellaneous selections and little stories, made their appearance; and being brought out at twopence or threepence they commanded a tolerably extensive sale. First among these was the 'Mirror of Literature,' which received a considerable amount of public patronage for about twenty years. At length, however, a new era dawned upon the world of serial literature, of which the 'Penny Magazine,' a weekly periodical, was the pioneer. This was established under the auspices of the 'Useful Knowledge Society;' an association which was formed about thirty-six years ago, for the publication of cheap works of a periodical as well as of a permanent character. The low price of this magazine, with its admirable engravings and judicious selections of articles, speedily obtained for it a circulation hitherto unprecedented. At one period no less than 220,000 copies were sold weekly. The success of this undertaking brought out a number of other penny publications, which entered upon a different kind of literature—that of fiction and poetry. Among these was the 'Family Herald' and the 'London Journal,' each containing sixteen 4to pages of closely-printed letter press, and published at one penny. These were succeeded by numerous copyists; but the most conspicuous and successful in the field was John Cassell, who brought out an 'Illustrated Family Paper,' the 'Popular Educator,' and other cheap serials of an equally useful character, all of which had an enormous sale. That of the 'Family Herald' is stated to be 200,000; of the 'London Journal' 350,000; and of the 'Illustrated Family Paper' 300,000. Contemporary with the 'Penny Magazine' was the 'Penny Cyclopædia,' of which the 'National Cyclopædia' is an amended revision. This also was under the auspices of the 'Useful Knowledge Society,' while Professor Long, of the London University, the Astronomer Royal, and other distinguished literati, were the principal contributors.

Independently of the numerous periodicals connected with popular literature, a host of cheap newspapers, since the remission of the stamp and advertisement duties, have sprung into existence; some at a penny, and others, of a local character, at a halfpenny each. The remuneration to the proprietors arises from the enormous circulation, and the vast number of advertisements. Thus the reading of periodicals, literary, scientific, and political, at this time may be said to be almost universal; while the general diffusion of useful knowledge is tending every day, more and more, to enlighten and civilize the human race. [NEWSPAPERS, *Supplt.*] Lord Brougham, when speaking of the newspaper press, in his late admirable lecture on 'Popular Literature,' observes that 'the use of these journals is incalculable; their importance, both to the Legislature, the courts of justice, the police department, is incontestable; and to the rights and to the lesser interests of the community their value is such as can only be duly estimated in countries which either never enjoyed such advantages, or have lost them through their wilful folly, possibly their crimes. But in less important respects these publications are of no little value; they are a source of constant entertainment, rational and even useful.'—'It thus appears that for the treatment of every subject, and to suit the condition, the capacity, and the taste of every class, there is ample provision made in the popular literature of the age; that the means are afforded of encouraging those to read who would else devote their hours of rest to mere listless vacancy of thought, or to dissipated courses; that the opportunity of fuller instruction is given to those who are desirous and capable of receiving it; that while all are thus greatly improved, some are made fit to improve others; that the instinct of curiosity effectually prevents all risks, converting, when desirable, superficial into solid information, but leaving even partial acquirement to do substantial good; and there is thus the clearest proof afforded of the people's instructors working out the ends of Providence by the employment of the means bountifully placed within their reach.'

PERJURY (ix.436). By stat. 14 and 15 Vict. c. 100, persons guilty of perjury can be committed by any of the courts of the country; and when the prosecution is directed by the court, the person prosecuting is indemnified for his costs.

PERNA (Gr. πίννα a ham or flitch), a genus of oyster-shaped mollusca, of the family *Aviculidæ*.

PERTHSHIRE, Scotland (ix. 456-61). According to the census of 1851, the population of the county was 138,660; inhabited houses, 22,528; area, 2,835 square miles, or 1,814,063 acres, of which upwards of a million acres are pasture or arable. The population of the principal places was as follows:—

Abernethy . .	2,026	Doune . . .	1,459
Alyth . pa.	3,152	Dumblane . .	1,816
Auchterarder .	2,520	Dunkeld . pa.	1,752
Blair-Athol pa.	2,084	——— . t.	1,104
Blair-Gowrie .	2,914	Kincardine . .	2,697
Callander pa.	1,716	Perth , bor.	23,835
Crieff . . .	3,824	——— . mun.	14,681
Culross . . .	605	Scone . . .	2,381
Cupar-Angus .	2,004		

PESTALOZZI, HENRY, the celebrated founder of a new system of education, was born at Zurich in 1745. In his youth he de-

voted himself to the study of jurisprudence and theology, with the intention of entering himself as a member of the bar or the pulpit; but, being in possession of a small property, he relinquished these views, and devoted himself to ameliorating the wretched condition of the peasantry, and endeavouring to cultivate their mental faculties. With this object he published a variety of works, and sacrificed much of his property; and it was not till 1798 that the Helvetic government extended their patronage to his laudable efforts. It was under their ægis that for many years he conducted an important educational institution; and the plan there introduced, known as the 'Pestalozzian System,' proved so successful, and has since become so general, that it has rendered his name celebrated throughout Europe. He died at Brugg, in 1827.

PET'ALITE (Gr. πέταλον a leaf, and λίθος a stone), a mineral of a greyish-red colour, and of a foliated texture. Its constituents are silicate of alumina and lithen.

PETER-PENCE, in the Middle age an impost levied by the pope for the purpose, as alleged, of erecting St. Peter's at Rome. In the first instance, it was presumed to be the voluntary tribute of the faithful; but afterwards it became in a measure compulsory, and was recognised in England by the laws of Edward the Confessor. In the reign of Edward III. it was discontinued; but being found of so profitable a nature, it was soon revived by the Holy See, and continued until Henry VIII. finally abolished it.

PHALAN'GIUS, and PHALAN'GIUM. [HARVEST SPIDER, *Supplt.*]

PHAROS, TOWER OF, a celebrated building, erected near Alexandria by order of Ptolemy Philadelphus, and reckoned as one of the seven wonders of the world. A strong light was always kept at the top of the tower to direct such vessels as sailed by night along those dangerous coasts.

PHASCOLOTHE'RIUM (Gr. φάσκωλον a leathern bag), a genus of marsupial quadrupeds, the fossilized remains of which have been found in the oolitic system of the secondary formation. Among the reliquiæ of the Stonefield slate, in Oxfordshire, have been found several mutilated lower jaws with teeth, belonging to this marsupial race. The jaw of one of these was submitted to Cuvier, who at once pronounced it to be that of a marsupial quadruped allied to the opossum. It was called *Phascolotherium Bucklandi*, from the affinity of the fossil animal to the wombat of New South Wales. Hence, as Dr. Buckland observed, this order, instead of being of more recent creation than other orders of mammalia, is, in truth, the most ancient condition under which animals of this class appeared on our planet. It was, in fact, the only type of mammalian organization before the tertiary period of the earth's crust, and once existed in Europe at a high northern latitude, though now restricted to Australia and the tropical parts of North and South America.

PHILIP'PIC, a term applied to any declamatory oration containing satirical and acrimonious invective. Thus the orations of Demosthenes, the Grecian orator, which were delivered against Philip, king of Macedon, were called *Philippics*; and the name has been transmitted to modern times.

PHILIP'SITE, the name of a mineral, which is a species of cross-stone, containing lime and potash; of a white, greyish, or flesh-red colour, and vitreous lustre. Its specific gravity is 2·0 to 2·2, and its hardness 4·5. Its constituent parts are silica, alumina, lime, and potash.

PHILLIMORE, JOSEPH, D.C.L., Regius Professor of Civil Law in the University of Oxford, and Commissary of the deaneries of St. Paul's and Westminster, was the eldest son of the Rev. J. Phillimore, of Orton, county Leicester, and born in 1766. He was educated at Westminster School, and elected to Christ Church, Oxford, in 1793. He soon distinguished himself by his learning and talents, and in 1804 received his degree of D.C.L. After taking the tour of the Continent he settled in London; and in November 1804 he was admitted an advocate in Doctors' Commons. So highly were his juridical and literary talents appreciated, that in 1809 he was nominated Judge of the Cinque Ports, Chancellor of the Diocese of Oxford, and Regius Professor of Civil Law at Oxford.

In 1817 Dr. Phillimore was returned to Parliament for the borough of St. Mawes; and he represented that borough until the dissolution in June 1826. He was then elected for Yarmouth, for which he sat until the dissolution in 1830. In 1834 he was made Chancellor of the diocese of Worcester, Commissary of the Dean and Chapter of St. Paul's, and King's Advocate in his office of Admiralty; Chancellor of the diocese of Bristol in 1842, and Judge of the Consistory Court of Gloucester in 1846.

Dr. Phillimore was the first to publish the decisions of the Ecclesiastical Courts, which had theretofore been considered as secret tribunals. One volume of his reports appeared in 1816, and three volumes in 1820. He also published, in 1848, a judgment delivered in his capacity of judge of the Ecclesiastical Court at Gloucester. To his abilities as a judge, Lord Lyndhurst, when Lord Chancellor, paid the highest tribute, designating (in his speech on introducing a bill for the reform of the Ecclesiastical Courts in 1844) the Diocesan Courts, in which Dr. Phillimore presided, as courts in which justice was as well administered as in any court in the country. He died in 1855, aged 89.

PHILYDRA'CEÆ (Gr. φίλος and ὕδωρ, a lover of water), a natural order of dipetalous Exogens, of which the plant *Philydrum* is the type.

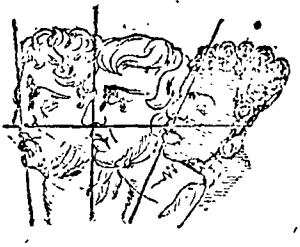
PHOCEN'IC ACID, a volatile acid obtained from *phocenine*, and composed of carbon 65·00; oxygen, 26·75; hydrogen, 8·25; specific gravity, 0·932.

PHO'NOLITE (Gr. φωνή sound, and λίθος, a stone), the Clink-stone, a species of basalt, which, when struck, is remarkably sonorous.

PHRENOL'OGY (ix. 538–45). The doctrine of Phrenology (or more properly speaking Craniology) still remains a *questio vexata*. Physiolo-

gists appear to be unwilling to admit it into the great family of the sciences; yet there are numbers who still place implicit reliance on the leading principles of cranial developments. The subject is, at least, worthy of consideration. We should say that 'in Phrenology there was much that was both *true* and *new*; but that which was *true* was not *new*, and that which was *new* was not *true*!' Thus the doctrine of mental physiology, as regards the peculiar formation of the head, was evidently acknowledged and understood by the ancient Greeks, as illustrated by their statues and the figures of their gods and heroes; and in this leading principle of Phrenology there may be some physiological truth; but the *undulating* system of organs is perfectly *new*, and peculiar to modern times—a German physician, by the name of Gall, being its originator,—and it only requires one thing to stamp it with value, and that is *truth!*

The Greeks perfectly understood that a prominent frontal development was a manifestation of intellect; and that a low receding forehead and large cerebellum indicated stupidity and strong animal propensities. These principles were also received and promulgated a century ago, by a German professor, named Camper, who indicated the degree of intellect possessed by men and animals, agreeably to what he styled the *facial angle*, of which a description is given in pp. 477-8 (*Supplt.*); and of which the annexed engraving, so far as it regards the human head, is a representation.



As this doctrine of cerebral organization appears to be based on something like physiological truth, on which the Phrenologists have evidently raised their superstructure, we shall endeavour to show the distinguishing line where truth may be said to end, and the fallacies of modern Phrenology to commence.

Blumenbach, a distinguished philosopher of Gottingen, notices three leading races of the human family, viz. the Caucasian, the Mongolian (inhabiting Central and Northern Asia), and the Ethiopian. [CAUCASIAN AND MONGOLIAN RACES, *Supplt.*] The Mongolian and the Ethiopian, or Negro, differ most from the Caucasian, and are greatly inferior in intellect. Blumenbach gives the preference to the Caucasian race in the scale of intellect. They received the appellation from Mount Caucasus, because it is generally supposed that civilization and the arts first sprang from that quarter of the globe. In the Caucasian race there are distinguishing marks of superior intellect; the head being larger, the forehead expanded, and the upper and fore part of it prominently developed.

The characteristics of the Ethiopian or Negro race are a low receding forehead, cheek bones prominent, the jaws narrow and projecting, and the occipital part of the head extremely large; all tending to show an inferior degree of intellect, and a preponderating quantity of animal force.

CAUCASIAN.

MONGOLIAN.

ETHIOPIAN.

These facts being admitted, it follows that there may be some physiological truth in the doctrine of Camper's facial angle, which consists of a line drawn from the projecting part of the upper jaw, to the most prominent portion of the forehead; and according to the angle it describes is measured the degree of intellect.

Thus far have we entered into the physiological principles of Phrenology, as understood by the ancients, and demonstrated by Camper; but in admitting that there may be some truth in the proposition that the frontal development of the cerebrum is indicative of intellect, and an extraordinary prominence of the cerebellum or posterior part of the skull, denotative of the animal propensities, it does not necessarily follow that an intellectually-formed cranium contains a finely organized brain; or that superior mind and genius are its necessary concomitants; for these chiefly depend on the exquisite and beautiful organization of the cerebral and nervous tissues, duly attempered by the sanguiferous fluids and secretive juices, which afford their possessor the means of treasuring up his stores of knowledge, obtained through the medium of his external senses, and applying them with judgment to the passing events of life, or directing his genius to the pursuits of literature, science, or art. The fact is, that the organs of mind are too deeply seated within the recesses of the brain, to be manifested with certainty on the external cranium; and although men of superior understanding are rarely deficient in frontal development, still there is many a fool, and many a shallow-pated coxcomb, with a finely-developed head. Hence we may rightly infer that there can be little reliance on the peculiar formation of the human skull, because the index on which we ought to rely is often fallacious. If then, it is unsafe to draw our conclusions from the physiological development of the cranium,

what shall we say to the marvellous system of the modern phrenologists (or *bumpologists*, as they have been nicknamed), which reduces the human skull to a perfect Macadamized road, being a map of undulations, developments, and manifestations, divided into three grand regions of propensities, sentiments, and intellect, with all their numerous subdivisions of amativeness, philoprogenitiveness, inhabitiveness, adhesiveness, secretiveness, covetiveness, &c., &c.; thus forming a new species of bastardized nomenclature; the words being chiefly classical in their radices, and Teutonic in their terminations, in direct contravention of all the acknowledged 'usages' of legitimate philology. Agreeably to this theory, these elevations of the skull are viewed as indications of proportionate elevations of the various lobes of the brain, in which the organs of particular faculties are supposed to reside.

The skull itself (say the phrenologists), being originally soft, was, as it were, moulded upon the brain, and thence it assumed its shape; and on the surface of various parts of the brain (they maintain), the organs of different faculties are placed, forming certain projections, cognizable by means of the bony elevations on the external cranium. The phrenologists also assume that the medullary part of the brain is fibrous, and originally derived from, or produced by, the cineritious or cortical substance by which it is externally covered. They endeavour to show that the fibrous matter is invariably the product of the cineritious; and imagine they can trace the whole of both the cerebrum and cerebellum to the *medulla oblongata*, from which they suppose they had their primary origin. They, moreover, conceive that there is a peculiar organization bestowed on different parts of the surface of the brain, just as there is to the organs of sense, in order to communicate to us the faculties of memory, imagination, or judgment, as well as of every other power and propensity.

Now the object of all these fanciful refinements is merely to represent that the lobes of the brain are the important seats of the nervous system, immediately connected with the cerebellum; from which the nine pair of nerves immediately pass; whereas it is generally admitted that the upper surface of medullary mass, which forms the various lobes of the brain, is little more than mere pulpy insentient matter, forming a kind of superincumbent covering, calculated to protect the nobler and more deep-seated organs of sensation, and to supply or secrete the nervous juices of the sensorium. But even if it could be demonstrated that the lobes, or organs of the brain, consisted of ganglia, or bunches of nerves, ramifying from the cerebellum, by what process of physiological reasoning can we determine that they are respectively the seats of particular faculties, sentiments, or propensities? The phrenologists answer that they have been enabled to discover this by a long series of observations, which have been extended to almost every class of animal creation; and although they may not be able satisfactorily to explain the rationale, still the multiplicity of facts which they can adduce in corroboration of the theory, entitles it to the same degree of credit as many of the inscrutable operations of Nature, which, as being self-evident to our senses, it would be folly to disbelieve, simply because we could not assign a rationale. No one (say they) would be so silly as to deny the existence of the sun, because he did not understand its solar materiality; or disbelieve that he himself existed, because he did not comprehend the laws of animal vitality. But, unfortunately, for this species of argument these pretended facts are not always self-evident, but often the reverse. We do not uniformly find that a man, with a feline-like protuberance behind his ears, is a destructionist or murderer, as indicated by the phrenological organ (No. 6); or a combative blackguard, as denoted by No. 5; or that he is a thief, because there happens to be a bony prominence above the ear, as shown by No. 9; neither do we discover that he is the best reasoner or metaphysician, who is graced with a couple of unsightly bumps on each side of his forehead, where they tell us the double organ of causality is situated; nor is it observable that he is the liveliest wit, or most skilful musician, whose bumps on the parietal and temporal bones are remarkably prominent. Indeed we frequently perceive their entire absence, where, if there were any truth in the system, they ought to be powerfully developed; and, on the contrary, we sometimes find organs extremely prominent in men whose sentiments or character are known to be the reverse of what they are said to indicate.

If the physiological rationale of the cerebral developments be so uncertain, what shall we say to the important fact of the external undulations of the cranium not corresponding with the interior; from which it is clear that the very index itself, on which the phrenologists rely, may mislead, and present a surface altogether different from the real elevations and depressions of the brain. Thus, on examining the section of a skull, we find that there are frequent elevations on the exterior parts, where the corresponding interior is perfectly smooth; and *vice versâ*, where the exterior is altogether smooth, or even indented, there is an elevation of the brain. Take, for instance, the occiput, called the organ of philoprogenitiveness, which nature has made very strong and thick to protect the posterior part of the brain from injury; and we shall find, instead of a protuberance of brain, there is usually a cavity—the skull thickening at this particular part, both internally and externally. But what is still more fatal to the theory, the elevations of some parts of the skull do not evince the prominences of the brain, because the inner surface of the projecting part does not come in contact therewith; of the undulations of which (the phrenologists say) the skull is an index. This is the case with some of the protuberances near the basis of the skull, in the neighbourhood of the ear, where the propensities of ruffianism and destructiveness are situated; and what is still more condemnatory of the theory, those important intellectual developments on the eye-brows, which manifest the faculties of form, colour, order, and number, are separated from the brain by a hollow space, called the frontal sinus, frequently large enough to admit a man's finger.

Thus the whole system, that makes the undulations of the skull the index of the brain, in which the propensities, sentiments, and intellectual faculties are said to be developed, entirely breaks down, and presents itself to every reflecting mind as 'the baseless fabric of a vision.'

PHRYGAN'IDÆ, a family of Neuropterous insects, of which the May-flies, or *Phryganinæ*, are a sub-family.

PHRYNEÏ'DÆ, a family of pulmonary *Arachnidæ*, of which the *Phrynus* is the type.

PHYLAC'TERY (Gr. *φυλακτήριον*, a preservative), in antiquity, a kind of amulet, supposed to protect the wearer from disease or danger of any kind. Among the Jews it was a slip of parchment, worn by devout persons, on which was inscribed some scriptural text. Among the primitive Christians it was a case in which the relics of the dead were inclosed.

PHYLLID'INÆ (Gr. *φύλλον* a leaf, and *εἶδος* resemblance), a sub-family of Tectibranchiate Mollusca, of which the *Philidea*, or Sea-Slug, is the type.

PHYLLITE (*φύλλον* a leaf, and *λίθος* a stone), a mineral composed of thin plates, of a dark-brown colour, and semi-metallic lustre; specific gravity, 2·89; hardness = 5·75. Its constituent parts are silica, alumina, peroxide of iron, magnesia, and potash.

[The Greek word *phyllon* (a leaf) is a prefix to numerous scientific words connected with Botany, zoology, &c.; as *Phylline*, and *Phyllis*, both genera of the Annelides;—*Phyllium*, *Phyllobius* (leaf-living), *Phylloceros* (leaf-horned), *Phyllocharus* (beauteous leaf), and *Phyllophage* (leaf-eating), all different genera of Coleopterous insects;—*Phyllocládus* (leaf-branching), a genus of plants of the order Taxaceæ;—*Phyllodactylus* (leaf-fingered), a genus of Saurian reptiles, of the family Iguanidæ;—*Phyllodus* (leaf-toothed), a genus of fossil fishes from the Isle of Sheppey;—*Phyllolobium* (pod-leaf), a genus of leguminous plants, of the sub-order Papilionaceæ;—*Phylloma* (leaf-fringed), a genus of plants of the order Liliaceæ;—*Phyllomorphus* (leaf-formed), a genus of Hemipterous insects, of the family Pentatomidæ;—*Phyllonotus* (leaf-backed), a genus of Mollusca, of the family Muricidæ;—*Phyllonycteris* (bat-leaf), a division of the order Cheiroptera, comprehending the foliated bats;—*Phyllophaga* (leaf-eating), a tribe of Marsupial quadrupeds; and also a class of Coleopterous insects, which live on leaves;—*Phyllopoda* (leaf-footed), a tribe of Crustaceans;—*Phyllopteryx* (leaf-finned), a genus of pike fishes, with fusiform bodies, of the family Syngnathidæ;—*Phyllostomata* (leaf-mouthed), a family of Bats;—*Phyllurus* (leaf-tailed), a genus of reptiles, of the family Lacertidæ, &c.]

PHYSA (Gr. a bladder), a genus of fresh-water Mollusca, belonging to the Limnacinæ; also a genus of plants, natives of Madagascar.

PHYS'ALITE (Gr. *φῦσα* a bladder, and *λίθος* a stone), a kind of prismatic topaz, of a light-green colour, consisting of alumina, silica, and fluoric acid. It is found in Saxony and Sweden.

PHYSI'NÆ (Gr. *φῦσα* a bladder), in ichthyology, a sub-family of the Gadidæ, of which the *Physis* is the genus. The head is broad and depressed, and the ventral fins almost wanting.

PHYTIPH'AGA (Gr. *φυτὸν* a plant, and *φάγω* to eat), in ichthyology, a class of Cetaceans, sometimes called Herbivora, from their feeding on plants.

PHYTOSAU'RUS (Gr. *φυτὸν*, and *σαῦρος* a lizard), an extinct fossil Saurian, found in the new red sandstone formation.

PHYTOTOM'INÆ (Gr. plant-cutters), in ornithology, a sub-family of the Musophagidæ.

PIC'ROLITE (Gr. *πικρὸς* bitter, and *λίθος* a stone), a mineral of a greenish colour, composed chiefly of carbonate of magnesia.

PICTORIAL WRITING. [SEMATOLOGY, *Suppl.*]

PICTS' WALL, a celebrated wall in the north of England, begun by the Roman Emperor Adrian, and completed by Severus. It was intended as the boundary of England, and to prevent the incursions of the Picts and Scots. It extended from Carlisle, in Cumberland, to Newcastle-upon-Tyne, and was eighty miles long, twelve feet high, and eight feet thick, with battlements and towers for its defence. Some parts of this wall are still to be seen, and towards Cumberland there is a town on its very ruins called Wall-Town.

PIEDMONT (ix. 565). The principality of Piedmont forms the metropolitan and central portion of the Sardinian States; and now comprehends the divisions of Turin, Coni, Alessandria, Aosta, and Novara. The inhabitants are nearly all Roman Catholics, except about 20,000 Vaudois Protestants in the Alpine valleys. The great Alpine routes into Piedmont, are the Simplon, Mount Cenis, Mount St. Bernard, and the Col de Tenda. Turin is the capital. The Piedmontese army is raised by conscription, and it amounts, in time of war, to 112,135 infantry, 18,757 cavalry, and 40 batteries of artillery. But owing to the menacing aspect of Italian affairs the army has been lately increased to 135,000 men, independently of the National Guard. By the laws of military conscription all young men, of twenty-one years of age, are subjected to the obligation of military service. Eighteen thousand are taken every year. Of these the first nine thousand form the contingent of the first category, and are immediately incorporated in the army, where they are actively employed during five years. The other nine thousand conscripts form the contingent of the second category. They have fifty days of camp instruction during the first year; then they remain at the disposition of the Government until they are 25 years old. [SARDINIA, *Suppl.*]

PILE-ENGINES (ix. 569). Instead of the vast mechanical force hitherto employed, hollow piles, constructed on hydraulic and pneumatic principles, have been brought into operation, the object of which is to remove the river soil or sand from beneath the pile, instead of hammering away at the top. The plan has thus been described by the author of 'Novelties, Inventions,' &c.:—'Suppose a pile to be about to be sunk in the sandy bed of a river. It is made hollow—a cast-iron cylinder in fact,—and is brought over

the spot where it is to be fixed; the top is air-tight, except an opening for a tube leading to an air pump above. When the air is drawn out of the cylinder, the sand and mud are picked up also, and the cylinder descends into the vacancy thus occasioned in the bed of the river. In a railway bridge built over the Shannon, the piles or cylinders were ten feet in diameter; but they sank with extraordinary rapidity into the sandy soil, where they form the support of the bridge. In the railway bridge constructed in 1852 across the Wye at Chepstow, hollow piles have been sunk by this method under circumstances of great difficulty. The tide rises fifty or sixty feet at that remarkable spot; and the hollow piles have enabled the engineer to surmount obstacles of a most embarrassing kind, by the combined aid of steam, water, and air.'

PINACEÆ. [CONIFERÆ.]

PINDARRIES, or PINDAREES (Hindustanee). A tribe of military freebooters, who, at the commencement of the present century, played a conspicuous part in our Indian belligerency. The name first occurs in the history of India in 1689; but it was only of late years that, from obscure freebooters, they rose to be the auxiliaries of the Mahratta powers, by whom their leaders were rewarded with lands. [MAHRATTAS.] Plunder being their sole object, they were suitably trained and equipped. Their policy, after securing their booty, was not to fight but to fly. Their force consisted of a light species of cavalry; and they were armed with a long bamboo spear; every fifteenth man having a matchlock. In 1809-12 these hordes of plunderers penetrated the lines of posts established by the British for the defence of their dominions at different points, and returned unscathed and enriched with spoil. In 1815-16 they repeated their visit, and marching in one day thirty-eight miles, plundered ninety-two villages; and during the twelve days they remained in the Company's territories, they put 182 persons to a cruel death, severely wounded 505, and put 3603 to different kinds of torture. The patience of the British Government being exhausted by their repeated inroads, it was resolved to attack and extirpate the Pindarries in their remotest haunts. The success of the war which took place in consequence is well known. The Pindarry force, hemmed in by the British, were intercepted at all points, and either destroyed or forced to submit. At the same time the formidable Mahratta power, which had sustained them, was entirely broken down.

PINNA (Lat. a shell-fish, or the fin of a fish), a genus of marine Mollusca, of the family *Mytilaceæ*, or Mussels. It is a longitudinal bivalve, with an acute base, and of a cuneiform shape; the valves coalescent. It is often found fossil in the limestone formation. The principal haunts of the *Pinna marina* are in the Mediterranean and the Indian Seas; and their filaments resemble in appearance the most glossy silks.

PIRÆ'US, one of the three Athenian harbours, formerly surrounded with porticos and forums, which were resorted to as the market of all Greece.

PIS'TACITE, a mineral, of a green colour, which occurs in granular and prismatic crystals; specific gravity, 3·42; hardness, 6·0 to 7·0. Its constituents are silica, alumina, lime, and oxides of iron and manganese.

PISTRUCCI, SIGNOR BENEDETTO, Medallist to Her Majesty, and Member of the Academy of St. Luke at Rome, was born in 1783, and came to England in 1816. One of his earliest patrons was Mr. R. W. Hamilton, who first purchased from him a cameo of the goddess Flora, which he had made to prove to Mr. Payne Knight, that a gem purchased by him of Bonelli in Rome for 100*l.* (in the belief that it was an antique) had been executed by Pistrucci himself. The cameo duplicate was placed in the hands of the Master of the Mint (Mr. Wellesley Pole) to show the Prince Regent, who sent for Pistrucci to take his royal highness's likeness. This led to the introduction of Signor Pistrucci into the public service of the country. In 1817, on the death of Mr. T. Wyon, Pistrucci was appointed to fill his situation in the Mint, at a salary of 500*l.* a year; and the first work he executed was an alteration of the half-crown die of George the Third. This alteration was made with the lathe and diamond. He was also the engraver of the coins of the remainder of the reign of George III., and of the early part of George IV. Denon, the director of the French mint, pronounced the crown-piece, executed by Pistrucci, to be the most beautiful coin in Europe. In 1820 he engraved the coronation medal of George IV., the obverse representing the King's portrait from Pistrucci's own design. But his great work (which may be mentioned among numerous others) was his large Waterloo medal, five inches in diameter, executed from his own design, and containing on one matrix no less than sixty figures. He also produced some large works in marble, particularly colossal busts of Prince Pozzo di Borgio and the Duke of Wellington.

During his lengthened career, Signor Pistrucci did not fail to incur public animadversion, especially for his disputatious and self-willed propensities; but his genius as a great artist could never be disputed. He died at Englefield Green, near Windsor, in 1856.

PITCH-PIPE, in music, an instrument used by vocal practitioners, to ascertain the *pitch* of the key in which they are to sing. (Busby.)

PLACOI'DIAN (Gr. πλάξ a broad plate, and εἶδος resemblance), in ichthyology, one of the orders in which are comprised the cartilaginous fishes of Cuvier. The order is distinguished by the skin being irregularly covered with plates of enamel. *In geology*, it is also one of the orders into which Agassiz divides the class of *fossil* fishes.

PLACU'NA (Gr. πλακοῦς a broad plate), a genus of Mollusca, of the family *Ostracidæ*, which are found only in a fossil state.

PLANETS (ix. 616). The powers of the telescope have of late years enabled us to add materially to the catalogue of the planetary system; and amongst our late discoveries, that of the distant planet Neptune is the most interesting. [NEPTUNE.] Of the smaller planets, or asteroids, discovered from 1801 to 1849, situated between the

orbits of Mars and Jupiter, we have already given a list; and we shall now present a tabular view of those which have been observed by our astronomers from 1850 to 1858; first premising that Mr. Hind, of London, has discovered *ten* out of the entire number; Goldschmidt, of Paris, *eleven*; Luther of Bilk, *seven*; Gasperis of Naples, *seven*; Chacornac of Paris, *five*; Pogson of Oxford, *three*; and Ferguson, Olbers, and Encke *two* each. The annexed table gives first the names of the planets discovered since 1850; secondly, the persons by whom first observed; thirdly, the places where discovered; and fourthly, the exact date when they were first seen.

PLANET.	DISCOVERER.	WHERE DISCOVERED.	DATES.
Parthenope.	Gasperis.	Naples.	1850, May 11.
Victoria.	Hind.	London.	1850, Sept. 13.
Egeria.	Gasperis.	Naples.	1850, Nov. 2.
Irene.	Hind.	London.	1851, May 19.
Eunomia.	Gasperis.	Naples.	1851, July 29.
Psyche.	Gasperis.	Naples.	1852, Mar. 17.
Thetis.	Luther.	Bilk.	1852, April 17.
Melpomene.	Hind.	London.	1852, June 24.
Fortuna.	Hind.	London.	1852, Aug. 22.
Massilia.	Gasperis.	Naples.	1852, Sept. 19.
Lutetia.	Goldschmidt.	Paris.	1852, Nov. 15.
Calliope.	Hind.	London.	1852, Nov. 16.
Thalia.	Hind.	London.	1852, Dec. 15.
Themis.	Gasperis.	Naples.	1853, April 5.
Phocea.	Chacornac.	Marseilles.	1853, April 6.
Proserpine.	Luther.	Bilk.	1853, May 5.
Euterpe.	Hind.	London.	1853, Nov. 8.
Bellona.	Luther.	Bilk.	1854, Mar. 1.
Amphitrite.	Marth.	London.	1854, Mar. 1.
Urania.	Hind.	London.	1854, July 22.
Euphrosyne.	Ferguson.	Washington.	1854, Sept. 1.
Pomona.	Goldschmidt.	Paris.	1854, Oct. 26.
Polyhymnia.	Chacornac.	Paris.	1854, Oct. 28.
Circe.	Cha ornac.	Paris.	1855, April 6.
Leucothea.	Luther.	Bilk.	1855, April 19.
Atalante.	Goldschmidt.	Paris.	1855, Oct. 5.
Fides.	Luther.	Bilk.	1855, Oct. 5.
Leda.	Chacornac.	Paris.	1856, Jan. 12.
Lætitia.	Chacornac.	Paris.	1856, Feb. 8.
Harmonia.	Goldschmidt.	Paris.	1856, Mar. 31.
Daphne.	Goldschmidt.	Paris.	1856, May 22.
Isis.	Pogson.	Oxford.	1856, May 23.
Ariadne.	Pogson.	Oxford.	1857, April 15.
Nysa.	Goldschmidt.	Paris.	1857, May 27.
Eugenia.	Goldschmidt.	Paris.	1857, June 28.
Hastia.	Pogson.	Oxford.	1857, Aug. 16.
Aglaia.	Luther.	Bilk.	1857, Sept. 15.
Doris.	Goldschmidt.	Paris.	1857, Sept. 19.
Pales.	Goldschmidt.	Paris.	1857, Sept. 19.
Virginia.	Ferguson.	Washington.	1857, Oct. 4.
Nemausa.	Laurent.	Nismes.	1858, Jan. 22.
Europa.	Goldschmidt.	Paris.	1858, Feb. 6.
Calypso.	Luther.	Bilk.	1858, April 8.
Alexandra.	Goldschmidt.	Paris.	1858, Sept. 11.
———	Searle.	Albany.	1858, Sept. 11.

PLASSEY, a town of Bengal, on the bank of the Hoogly River, celebrated as being the scene of a great victory obtained by Col. Clive in 1757, over the Nabob Suraj-ad-Dowlah.

PLATINUM (ix. 635). Since the first discovery of this metal, it has been found to exist, in considerable abundance, in different parts of the world. But perhaps the most famous platinum mine is that of Santa Fé, near Carthagena, in South America, from which locality most of the platinum of commerce is imported into Europe. It has likewise been discovered to exist abundantly on the eastern declivity of the Ural Mountains in Russia, and also in Mexico, St. Domingo, Brazil, Borneo, and other places. The peculiar properties of this metal have been thus noticed by a metallurgical correspondent:—'By some extraordinary process, the laboratorian chemists can liquefy this metal; but it cannot be melted by the strongest blast-furnace, nor by any of the appliances in ordinary use by metal-workers; hence it is said to be infusible; and did it not possess that property called welding, that is, of uniting or adhering together when squeezed or hammered at a white heat, it would be almost useless. As however it *can* be welded, various useful vessels are made of it; and thus we find that it has qualities peculiar to itself. No single acid will dissolve it; hence its very refractory nature renders it invaluable to philosophers. In a platinum crucible they can submit other substances to experiment either with fire or chemicals without any fear of modification from the containing vessel.' The same correspondent also states that at several of the perfumery factors' warehouses may be seen what they call the 'Philosophical Incense Lamp.' This lamp once ignited will never go out unless purposely extinguished, provided of course that there be material to consume. This property is due to a little platinum ball placed in the wick, which once being made red hot with the flame, will remain incandescent to the end of time. It is this property which is a still unexplained secret of nature. The incense lamps are 'trimmed' with a sweet-smelling spirit, and the red-hot platinum causes this to evaporate, thus perpetually flinging fragrance around.

PLA'TONISM, a term applied to the philosophy of Plato (ix. 637). It has been divided into three branches—Theology (including Moral Philosophy), Physics, and Mathematics. The foundation of his philosophy was the eternal existence of two great principles, God, the maker of all things, and matter, from which all things are made. It was one of his fundamental maxims, that out of nothing, nothing could proceed.

PLATYCAN'THUS (Gr. πλατὺς broad, and ἄκανθα a spine), a genus of fishes of the family *Balistidæ*; and so called from the plates or spines scattered over the body.

[The Greek word *platys* (broad) is of very general use in the formation of scientific words, especially in botany and zoology; as *Platycarpum* (broad fruit), a genus of plants, of the order Bignoniaceæ;—*Platycephalinæ* (broad-headed), a subfamily of the Scorpenidæ;—*Platycercinæ* (broad-tailed), a sub-family of birds (the Loriets), of the family Psittacidæ; and so called from their very broad and long tails;—*Platyceras* (broad-horned), a genus of Coleopterous insects, of the family Lucanidæ;—*Platycrinites* (broad lily), in geology a class of Crinoidians;—*Platygaster* (broad-bellied), a genus of fishes, of the family Salmonidæ, and belonging to the Clupinæ, or Herrings;—*Platylepis* (broad-scaled), a genus of fishes, of the family Zeidæ;—*Platyonyx* (broad-clawed), a genus of Coleopterous insects, of the family Curculionidæ;—*Platypterix* (broad-winged), a genus of nocturnal Lepidopterous insects;—*Platypterus* (broad-winged, or broad-finned), a genus of fishes, of the family Gobidæ;—*Platysoma* (broad-bodied), the third family, according to Cuvier, of Tetramerous Coleoptera;—*Platystoma* (broad-mouthed), a genus of dipterous insects, of the family Muscidæ;—*Platyurus* (broad-tailed), a genus of birds belonging to the Wrens. Thus there is a great

variety of genera to which the word *platys* is applied as an appropriate prefix, expressive of form or shape, but which our limits would not allow us to enumerate.]

PLECOS'TOMUS (Gr. πλικτὸς plaited, and στόμα a mouth), a genus of fishes, of the family *Siluridæ*.

PLECTOGNA'THES (Gr. πλικτὸς, and γνάθος a jaw), Cuvier's sixth order of fishes, of the two families *Gymnodontes* and *Schlerodermes*.

PLECTORYN'CHUS (Gr. πλικτὸς, and ῥύγχος a snout), a genus of fishes, of the family *Chætonidæ*.

PLECTRIS (Gr. πλῆκτρον a cock's spur), a genus of Coleopterous insects, of the family *Scarabeidæ*.

PLECTROPH'ANES (Lat. *plectrum* a quill, and Gr. φανὸς brilliant), a genus of birds, of the family *Fringillidæ*.

PLECTROPO'MA (Gr. πλῆκτρον a cock's spur, and πῶμα a lid), a genus of fishes, of the family *Percidæ*.

PLECTROP'TERIS (Lat. *plectrum* a quill, and Gr. πτερὸν a wing), a genus of Anserine birds, of the family *Anatidæ*.

PLE'SIOPS (Gr. πλησίος near, and ὄψ the eye), a genus of fishes, of the family *Chætonidæ*.

PLUNKET, RT. HON. WILLIAM CONYNGHAM, first LORD, of Newtown, co. Cork, was the son of the Rev. Thomas Plunket, and born at Enniskillen, in 1764. He was educated at Trinity College, Dublin, where he graduated with considerable credit. In 1787 he entered into the profession of the law; and was afterwards brought into the Irish House of Commons for the borough of Charlemont. He soon distinguished himself as a popular orator; and from night to night, during the debates on the Union, he directed against the Treasury benches an unceasing torrent of wrathful eloquence. The extinction of the Irish Parliament, however, appeared for a time to annihilate Mr. Plunket's hopes of establishing his character as a statesman. He 'improved the occasion,' however, by securing the greatest forensic reputation that any Irishman ever attained. When the rebellion of 1798 burst forth, Mr. Plunket was a member of Parliament, a rising man at the bar, and the father of a family — all cogent reasons, even if higher motives were wanting, to restrain him from abetting that sanguinary movement; though he subsequently gave his professional aid to some few among its leaders and victims.

In 1803 Mr. Plunket was advanced to the office of Solicitor General for Ireland, and in 1805 to that of Attorney-General. In 1806, when the Ministry called 'All the Talents' forced themselves upon George III., Mr. Plunket continued to be the first law-officer of the Crown in Ireland. The death of Mr. Fox, however, and the pressure on the King respecting Roman Catholic claims, broke up the Government; and Mr. Plunket resigned, after holding the office of Attorney-General till May 1807. He was now in all respects at the head of the Irish bar. In every Chancery suit he appeared as leading counsel, and continued in the undisputed enjoyment of that position from 1807 till 1827, in the course of which period his fees, exclusive of professional gains during the preceding twenty years, could not have amounted to less than an average income of 6000*l.* per annum.

On the general election of 1812 Mr. Plunket took his seat in the British House of Commons as representative of the University of Dublin. The death of the Marquess of Londonderry, in 1822, led to a variety of Ministerial changes, and Mr. Plunket received the office of Attorney-General for Ireland.

In January 1827 Mr. Plunket was raised to the peerage of the United Kingdom, by the title of Baron Plunket, and at the same time appointed Chief Justice of the Common Pleas in Ireland; in which important office he continued till the close of the Wellington administration.

While the Roman Catholic Relief Bill was under discussion in the House of Lords, the Duke of Wellington invited Lord Plunket to sit with him on the Treasury Bench, to advise him step by step, 'to take charge of the Bill,' and see it fairly through the House. The measure having been carried, the labours of Lord Plunket, as a legislator, reached their close. With the exception of five months, between November 1834 and April 1835, the Whigs remained in possession of the Cabinet, and Lord Plunket was their Irish Chancellor, until a short time before their withdrawal from office, when he reluctantly resigned, and was succeeded by Lord Campbell. In 1841 his public life may be considered as terminating. Still for many years he continued to enter warmly into the social relations of life, when he never ceased to charm by the powers of his intellect and conversation. He died in 1854, aged 89.

POLAND (ix. 683–9). In 1844 the Emperor of Russia issued an edict, by which the kingdom of Poland was divided into five governments, each having a military and civil governor; and according to the official returns of 1851, the population of each government was as follows: Warsaw, 1,544,790; Radom, 939,344; Lublin, 1,028,383; Augustovo, 626,594; Plock, 626,594; and the city of Warsaw, 164,115; the total population being 4,851,639; with an area of 49,090 square miles.

POLICE (ix. 700–702). By stat. 19 and 20 Vict. c. 69, (1857,) the establishment of a regular police force throughout all England was rendered compulsory; and by the same Act the whole is placed under the inspection and control of the Secretary of State. One-fourth of the expense is to be defrayed out of the public treasury. Of the Metropolitan police a certain number are always employed on special duty; of which there are 13 inspectors, 19 sergeants, and 28 constables. Of 28 policemen employed as detectives, 7 are engaged in the detection of criminals, 1 at the Queen's Palace, 2 at the Post Office, and 18 in checking the duty on metropolitan stage carriages for the Inland Revenue Department. 11 constables are employed in the London docks, and 120 in Deptford and Woolwich dockyards, at the expense of the Dock Company and the Admiralty and War Departments. 149 are employed at various public buildings, 12 at museums, 12 at institutions, and 9 at the theatres, all at the cost

of the respective departments, institutions, and proprietors. Only 2 officers are engaged at the Royal Italian Opera, Covent Garden, 2 at Astley's, and 1 at each of the other metropolitan theatres. 1 policeman suffices to keep order in Kew Gardens and Bushey Park, whereas the National Gallery employs 5. The House of Commons requires the services of 31 policemen, and the House of Peers 19. The Tower and Greenwich Hospital employ 13 and 14 respectively.

POLIGNAC, JULES, PRINCE DE, Prime Minister of Charles X. of France, whose administration produced the revolution of 1830, and overthrew the Bourbon dynasty, was born in 1783. He was descended from an ancient family, whose vicissitudes of fortunes were remarkable. Among his ancestors was the celebrated Cardinal Polignac, who died in 1741 (ix. 702). The object of this memoir, owing to his rigid adherence to the old régime of France, like his family predecessors, was exposed to all the vicissitudes of fortune. He was implicated in Georges' conspiracy against Napoleon in 1804; and suffered six years' imprisonment in the castle of Vincennes. On the restoration of the Bourbons, in 1814, Polignac strenuously devoted himself to the interests of the Pope, the church, and Count d'Artois; for which he was rewarded by the sovereign pontiff with the title of a Roman prince. From 1823 to 1829, he held the post of ambassador at the Court of St. James; after which he was appointed to the premiership of the new Ministry of France. In this position, aided by the sovereign and the priesthood, he attempted to annihilate the freedom of the press, and destroy the established constitution; but the popular resistance was so universal and determined, that, after three days' sanguinary fighting, the government and the sovereign were overthrown. Polignac was tried by his peers, and condemned to death; but his life was spared, and after a short imprisonment he was allowed to go into exile. He was afterwards permitted to return to France, though not to Paris; but after the deaths of Charles X. and the Duc d'Angoulême he sank with a broken constitution into a state of melancholy; and died in 1847.

POLK, JAMES KNOX, President of the United States, was born in North Carolina, in 1795. After the usual course of education, he entered the legal profession, and in 1820 became a member of the bar. In 1825 he was elected a member of Congress, where he was three times chosen speaker. His opinions were democratic, and by that party, in 1844, he was chosen president of the republic. He proved himself a judicious and energetic ruler; and it was during his administration that the Texas were annexed to the United States, and the war against Mexico successfully terminated. He died in 1849.

POLYDON'TES (Gr. πολὺς many, and ὀδοντες teeth), a genus of Mollusca, belonging to the Land-volutes, of the family *Helicidæ*.

POLYSPHA'RITE (Gr. πολὺς, and σφαῖρα a sphere), a mineral of a light-brown colour and greasy lustre, from the mines of Freyburg, in Saxony; specific gravity, 5·83.

POLYTECHNIC SCHOOL, an important military school established at Paris, for the education of artillery officers, as well as civil and military engineers of every description. It had its origin in the central school which was established, in 1794, by Mr. Lamblardie. But in 1795 it was re-organized by the National Convention, and received its present appellation. In 1805 it received from Napoleon a military organization, and was placed under the minister of war. In 1814, the pupils of the École, formed into three companies of artillery, defended the Barrière du Trone with twenty-eight guns; but the feeling of independence created by this event gave much trouble in after years to the college authorities; and in 1816, 1830, and 1832, the school had to be dissolved and re-organized. The examinations for admission are public to all France; but as the scholars have to pay an annual sum of 30*l.*, besides a deposit of 40*l.* for clothing, and as the education is expensive, it is very much confined to the wealthier classes. (*Milit. Encyc.*)

POLYTROPA (Gr. πολὺς, and τρόπη a turning), a genus of Mollusca, of the family *Turnellidæ*.

POLYZO'ON (Gr. πολὺς many, and ζῶον an animal), a compound animal, or a system in which many animals are united in one structure. [BRYOZOA, *Supplt.*]

POMA'CEÆ (Lat. *pomum* an apple), a natural order of Exogenous plants, consisting of trees and shrubs; flowers white or pink; fruit a pome; of which the apple and pear are examples. This order is nearly allied to the Rosaceæ.

PONTAGE (Lat. *pons* a bridge), in the Middle age, a toll levied, or contribution made for the building or maintenance of bridges. This was accounted one of the three public charges on the nation, from which none were exempt, not even bishops, abbots, or monks, as Selden informs us.

POOR LAWS and PAUPERISM (ix. 743–51). The formation of parish unions in England and Wales, and their operations from 1834 to 1844, have already been noticed. Since that period these unions have increased from 587 to 643, and comprehend 14,320 parishes in England and Wales. Great fluctuations have taken place each year in the number of paupers, and the amount of rates increased thereby. From 1849 to 1855 inclusive, the number of persons, dependent wholly or in part on legal charity, amounted on an average to upwards of 940,000, or more than five per cent. of the population, During the year 1855 the average number of paupers of all classes was 897,686; and of these, 146,631 were set down as able-bodied poor. The sums expended in the relief of these paupers amounted to 5,890,041*l.*; while the average outlay of the seven years previous to 1855, was 5,300,000*l.* This amounts to a charge of about 1*s.* 6*d.* in the pound on all rateable property, or a tax of 7½*d.* per cent. for the support of the destitute poor. The number of paupers relieved in the unions on the last day of the fourth week of October, 1856, were—in-door, 27,726; out-door, 63,755: total, 91,481. In 1857, on the same date, the numbers were—in-door, 27,197; out-door, 64,931: total, 92,128. The total of the eleven divisions of Eng-

land and Wales was, in 1856—in-door, 116,325; out-door, 705,946: total, 822,271. In 1857—in-door, 116,851; out-door, 706,034: total, 822,885, being an increase of 614, or 0·07 per cent. The divisions which show a decrease are—the eastern, 2676; the south-western, 2599; the west midland, 2925. The north-western division shows an increase of 4399. At the end of the year 1857 there were 908,186 paupers in receipt of parish relief in England and Wales.

It is gratifying to observe that pauperism in Ireland, which in the years 1846–7 had increased to a frightful extent, has of late years been rapidly diminishing. At the commencement of 1849 there were 620,747 persons receiving parish relief. On the 1st of January 1857, there were, in the 163 unions of Ireland, only 55,183 persons receiving in-door relief, and 911 out-door relief; thus showing, from the return of the same date in the preceding year, a total decrease of 16,989 paupers; while less than a third of the workhouse accommodation was in use. At the end of the year 1857, the Irish paupers were returned at 50,582.

In Scotland the total amount expended in poor-law relief and other contingencies, during the year ending May 14, 1857, was 629,348*l.* The number of registered poor, who received relief during that year, was 88,622, being a decrease of 10,740 as compared with the previous year. The casual poor relieved were 36,545.

The reduction of pauperism in the British metropolis during the year 1858, was very gratifying. The returns of the metropolitan workhouses, at the close of the year, showed that about 60,000 persons were recipients of parochial relief throughout the metropolis, and that in January 1859 there was a reduction of the workhouse inmates, as compared with the same period of 1858, of 6000; and a saving, in the prime necessaries of life, of from 15 to 25 per cent.

POPLIN, a kind of textile fabric, made of worsted and silk, of which there are many varieties; as brocaded, figured, watered, tissued, &c. The principal seats of its manufacture are Dublin and Norwich. At the latter place are produced a variety of poplins, under various names; as bombazeens, crapes, paramattas, chinés, stuffs, camlets, silk and barège shawls, &c.; while at Dublin they have damasks, tabinets, tabarets, and other manufactures, which all comprise worsted for the weft, and silk for the warp thread. The poplins of Dublin may be considered as superior to those of Norwich; but the latter are cheaper, and this results chiefly from the small amount of pay allowed to the women and girls employed in winding the silk on the bobbins of the shuttles, a dozen skeins of 500 yards each being wound for one penny!

POPULATION. A summary of the population of England, Wales, and Scotland, will be found under GREAT BRITAIN (*Supplt.*); of Ireland, under the article IRELAND; and of the principal cities, towns, and parishes of the United Empire, under the respective counties to which they belong; a synoptical view of the whole being given under the article CENSUS, *Supplt.*

PORIFERA (Lat. *porus* a pore, and *fero* to bear), a term applied to the marine and fresh-water Sponges; and also to a family of Polypi, including the genera *Tubulipora*, *Cellepora*, and *Millepora*.

PORPHYROXINE (Gr. πορφύρεος purple, and ὄξυς acid), the name of a non-azotized principle found in opium of Bengal. It is insoluble in water, but soluble in alcohol.

PORT PHILLIP, an extensive bay on the south coast of Australia, lat. 38° 18′ S. and long. 144° 42′ E. The port forms a magnificent basin about 35 miles in length and width, capable of holding all the navies in the world. Melbourne is the capital, situated on the north bank of the Yarra-Yarra River, which flows into the bay; and on the west side is the rising town of Geelong.

PORTER, ANNA MARIA, and JANE, the two accomplished sisters of Sir Robert Ker Porter (ix. 767). The former entered into the path of light literature at an early age, and soon distinguished herself, as a brilliant writer of fiction, by her 'Hungarian Brothers,' 'Don Sebastian,' 'The Recluse of Norway,' 'The Knight of St. John,' 'The Barony,' &c. She died in 1832.

Her sister JANE was born at Durham, in 1776. Though she did not appear before the world as an authoress before her 27th year, her first work, 'Thaddeus of Warsaw,' which appeared in 1803, at once placed her in the foremost rank as a writer of fiction. This was followed, in 1809, by the celebrated historical novel of the 'Scottish Chiefs,' which had a most successful run. These two standard novels, which alone were sufficient to establish her fame, were followed at intervals by different works of fiction, which were all favourably received; among others, the 'Pastor's Fireside,' 'Tales round a Winter's Hearth,' 'The Field of the Forty Footsteps,' &c. In 1842 she accompanied her brother, Sir R. K. Porter, to St. Petersburg; and after his death took up her residence at Bristol. She died in 1850.

PORTUGAL, KINGDOM OF (ix. 772-7). According to the official returns of 1851, the population of Portugal was 3,487,025, with an area of 35,189 square miles. In 1853, the death of the reigning queen, Donna Maria da Gloria, took place, when she was succeeded by her son, who took the title of Pedro V., the present sovereign of Portugal.

As to the present trade of Portugal, it has been shown by Mr. Paget, our diplomatic agent at Lisbon, that the exports from Oporto to England amount to 5,712,581 milreis, and the imports from England into Oporto to 5,475,769 milreis (the milrei being about 4*s.* 6*d.* sterling). The exports from Lisbon to England amount to 1,669,050 milreis, and the imports from England into Lisbon to 4,138,522 milreis. These figures show that the trade of Portugal with England is more than double the whole of her trade with the rest of the world.

POST-OFFICE. Our notices of this stupendous establishment, with its progressive improvements and extensive ramifications, were brought down to the date of 1849 (ix. 782–5). Since that period, its varied operations and general extent of business, have been unprecedented in the annals

of this or any other country. According to the fourth annual report, issued by the Postmaster-General for the year 1857, it appears that there are 11,291 post offices in the United Kingdom, being an increase of 235 on the preceding year, and that the number of letters conveyed was 504,000,000, or an average of 17 to each inhabitant; 21 in England; 16 in Scotland; and 7 in Ireland. The post letters were more than sixfold the number in 1839. A quarter of the whole were delivered in London and its suburbs. There were 1,250,000 'registered' letters, containing money or other valuable articles. The newspapers sent by post were 71,000,000. There were no fewer than 1,700,000 'dead' letters, and 580,000 'dead' newspapers. The book-packets were about 6,000,000. The number of money orders issued in the United Kingdom were 6,389,703, for a total sum of 12,180,272*l.*; the commission charged being 106,852*l.*, and the net profit 24,175*l.* The gross revenue of the Post Office was 3,035,713*l.*, and the net profit 1,322,237*l.*

The number of letters conveyed between Great Britain and Australia was estimated at 1,500,000, and the newspapers at 2,280,000; the gross revenue of which was about 47,000*l.* The letters conveyed between this country and the East Indies and China, were 1,532,000.

Such are the magnitude and importance of our post-office establishments; and, to facilitate and expedite the business of delivery, many judicious regulations have been adopted. Thus London and its suburbs are divided into ten postal districts, indicated by the eight points of the compass in addition to the East and West Central districts. In each district there is a chief sorting office, which has a direct postal communication with the chief office of every other district, and with every post town in the kingdom. Letters arriving at these offices are separated into letter-carriers' walks, and immediately distributed. In many of these walks there are hourly deliveries of letters; into which deliveries those letters fall that are continually flowing into the metropolis from provincial towns, and from foreign mails landed at the outports throughout the day. There are about 500 letter carriers for the first morning delivery in London, each carrying as many bags into the different districts of the metropolis; and for the sake of expedition the postmen are conveyed by omnibuses to their different beats in the suburbs. In addition, there are upwards of 700 pillar-posts, or road letter-boxes, for the reception of letters in the United Kingdom.

The staff employed in the different post-office departments of the kingdom, on the 1st of January 1858, was estimated at 23,731, consisting of 1 postmaster-general; 5 secretaries; 15 surveyors; 19 heads of departments, &c.; 11,101 postmasters; 1610 clerks; 204 guards; 10,427 letter carriers, messengers, &c., besides postmasters, clerks, and agents in the colonies and foreign countries. In the London district alone there were about 3200 *employés*.

The regulations for the *Book-post* deliveries have been found of the greatest convenience, and more especially to publishers, editors, and printers. For inland conveyance the rates are—1*d.* for each packet not exceeding 4 oz.; 2*d.* when not exceeding 8 oz.; up to 16 oz., 4*d.*; up to 1½ lb., 6*d.*; and so on; 2*d.* for every additional half-pound or any less weight. In all cases the postage must be prepaid by stamps affixed. No packet must exceed two feet in length, width, or depth; and any cover must be open at the ends or sides so as to admit of inspection. A packet may contain any number of separate books or other publications, such as prints and maps, and any quantity of paper, parchment, or vellum; and the books or other publications may be either printed, written, or plain, or any mixture of the three. The only restriction is that nothing in manuscript shall bear the character of a private epistolary communication. In the same manner *Newspapers*, and other periodicals published at intervals not exceeding thirty-one days, bearing the stamp denoting the stamp-duty, are transmitted and re-transmitted free by the post to any part of the kingdom for fifteen days after date of publication, provided the cover is open at the ends, the stamp visible, and there is no enclosure or writing except the address. If the paper has already passed through the post the previous address must be cut off, not merely erased.

The system of *Registered Letters*, on which a fee of 6*d.* is prepaid, does not guarantee their safe delivery, nor does the post-office undertake any responsibility; but the transmission is more secure, by rendering it easier to trace such letters from their receipt to the delivery. For letters going abroad, or letters posted in London, this extra fee may be paid either in money or by stamps affixed; but for all inland letters posted throughout the country the payment must be by stamps. The letter so prepaid must be presented at the window, and a dated receipt is given for it. If dropped into the box, a letter marked 'registered' will be liable to an additional fee of 1*s.* on delivery, besides the stamped registration prepayment.

The *Money-Order Office*, through which so great an amount of business is constantly passing, is a separate branch of the postal services; and so extended has been the business of this department, that 138 new money-order offices have been lately opened, 95 in England and Wales, 34 in Scotland, and 9 in Ireland; the total number at present open being 2238. In applying for a money order, the surname and one of the Christian names, and the address of the remitter (or person who sends the money), must be stated, and the name of the payee, or person to whom the money is to be paid.

A return was lately made to the House of Commons respecting the affairs of the *Dead Letter* department of the Post Office, when some curious facts were stated. In one year, 1856, no less than 2,400,000 letters were sent to the 'Dead-office.' Upwards of a million and a half were returned to the writers; 435,000 were destroyed, after every effort to discover the writers had failed; 185,000 were returned unopened to foreign countries and the colonies; and 187,000 were re-issued to corrected addresses. No less a sum than 670,000*l.* in

money, cheques, jewellery, and other valuables, was contained in these misdirected letters, and after the owners who could possibly be discovered were found, letters containing a quarter of a million sterling still remained in the Dead Letter Office.

It appears that in 1858 there were 523,000,000 letters posted in the United Kingdom, of which two millions and a half were not prepaid; sixty per cent. of these latter being of an annoying character. It was therefore thought expedient to make the prepayment of all letters imperative; and on the 27th of January, 1859, an order was issued, by the Postmaster-General, that on and after the 10th of February, all inland letters should be prepaid by postage stamps; and if not so paid they should be returned to the writer, after having been forwarded to the offices specially appointed for the purpose in London, Edinburgh, or Dublin. But owing to the dissatisfaction thence arising, the regulation was soon rescinded.

POTALIA'CEÆ (from the genus *Potalia*, of Guiana), a natural order of Exogenous plants, consisting of shrubs or trees; the flowers disposed in corymbs, and the berry two or four celled.

POTAM'IDA (Gr. ποταμὸς a river), a genus of fresh-water Mollusca, of the family *Unionidæ*.

POTAMOPH'ILA (Gr. ποταμὸς, and φιλέω to love), a genus of bivalve fluviatile Conchifera, of the family *Tellinidæ*.

POTATO (ix. 788–91). This valuable esculent is now applied to a variety of uses, and more especially by our continental neighbours. Among the French, their sauces, gravies, and soups, as well as their bread and pastry, are indebted for their excellence to this useful esculent, and even a considerable portion of the so-called Cognac is manufactured from this root, and imported into England. 'Throughout Germany,' says a cotemporary writer and traveller, 'the same uses are common; and in Poland the manufacture of spirits from the potato is a most extensive trade. "Stettin brandy," well known in commerce, is largely imported into England, and is sent thence into many of our foreign possessions as the produce of the grape, and is placed on many an English table as the same; while the fair ladies of our country perfume themselves with the spirit of potato, under the designation of *Eau de Cologne*. But there are other uses to which this esculent is turned abroad. After extracting the farina, the pulp is manufactured into ornamental articles, such as picture-frames, snuff-boxes, and several descriptions of toys; and the water which runs from it, in the process of manufacture, is a most valuable scourer.'

POTTINGER, RIGHT HON. LIEUT.-GENERAL SIR HENRY, Bart., G.C.B., &c., was the fifth son of Edward Curwen Pottinger, Esq., of Mount Pottinger, co. Down, and born in 1789. In 1804 he went to India as a cadet on the Bombay establishment, and for a series of years was actively employed in different branches of the public service. For more than seven years he was Judge and Collector at Ahmednuggur, in the Deccan; and for fifteen years the political resident at Cutch and Scinde. At this time he held the rank of Major-general; and so highly were his talents and services appreciated, especially by the Governor-General of India (Lord Auckland), that in 1839 he was raised to the baronetage. In 1840 he returned to England; but in 1841, when the differences with China broke out, on account of the opium trade, Sir Henry was selected by the British government to discharge the office of mediator, in the capacity of Minister Plenipotentiary of Great Britain. He arrived at Macao in August of the same year, immediately after the capture of Canton by Lord Gough. Amoy was soon afterwards captured; and the genius and clear-sightedness of Sir H. Pottinger mainly contributed to bring to a successful issue our arduous contest with the crafty Chinese [CHINA, *Supplt.*]. For his diplomatic services, in securing so favourable a treaty, he was rewarded with the Grand Cross of the Order of the Bath, and appointed Governor of Hong-Kong. In 1844 he returned to England, and was made a member of the Privy Council, with a pension of 1500*l.* a year settled on him by the House of Commons. In 1846 he was appointed Governor of the Cape of Good Hope. In 1847 he proceeded to India as Governor and Commander-in-Chief of the Presidency of Madras, which post he held, and nobly fulfilled its arduous duties, until the year 1854, when he finally returned to England. He died in 1856.

POTTO, a singular kind of Lemurine, prehensile-tailed animal (the *Cercoleptes caudivolvulus* of Illiger), which inhabits the forests of South America. The name is applied by the natives of the Great Antilles; but from its extracting the honey with its long tongue from the honeycombs of the bees, the missionaries have named it the Honey-bear. It has a woolly fur, of a yellowish brown. It is nocturnal, but is of a mild and gentle disposition, subsisting on fruits, honey, milk, &c.

PRAYER-BOOK (ix. 816–17). Our Book of Common Prayer, as used in the Established Church, has undergone some modifications and curtailments. In January 1859, a royal warrant, under the sign manual, revoked the authority under which certain forms of prayer have hitherto been used on the 5th of November, the 30th of January, and the 29th of May; entitled 'Form of Prayer with Thanksgiving,' or the deliverance of King James from the Gunpowder Plot; 'Form of Prayer with Fasting' in commemoration of the 'martyrdom' of Charles I.: and 'Form of Prayer with Thanksgiving' for the 'unspeakable mercy wonderfully completed' in the restoration of King Charles II.

PREROGATIVE COURT (ix. 821). Since the establishment of the Courts of Divorce and Probate, the jurisdiction of this Court, as well as of the Ecclesiastical Courts in general, may be considered as annihilated. [PROBATE, COURT OF, *Supplt.*]

PRESCOTT, WM. HICKLING, the distinguished historian, was born at Salem, Massachusetts, in 1796, where he resided until his father's removal to Boston, when he was twelve years of age. His grandfather was the Hon. William Prescott, a compatriot of Warren, Adams, and Hancock, in the early revolutionary struggles.

Washington called him 'Prescott the brave.' His father was a jurist and a lawyer of extensive practice. Young Prescott entered Harvard College in 1811, and graduated in 1814. Early in life he devoted himself to literary pursuits; and shortly after leaving college undertook a tour through England, France, and Italy. Soon after his return he married, and then quietly applied himself to a life of literature; but having accidentally lost one of his eyes in early life, and the other being greatly impaired, he was obliged to use the eyes of others for his historical researches, as well as to record the results of them. About this time he was a frequent contributor to the various literary periodicals of the day; and most of these earlier productions of his pen were published in 1845, in one volume, entitled 'Biographical and Critical Miscellanies.' His first great work, however, was 'The History of the Reign of Ferdinand and Isabella the Catholic,' which appeared in 1838, and was received with the utmost enthusiasm. It was immediately translated into Spanish, French, and German; and its author was elected a member of the Royal Academy at Madrid. The work is now one of the established classics both in England and America. His next great work was the 'History of the Conquest of Mexico, with a Preliminary View of Ancient Mexican Civilization, and the Life of the Conqueror, Hernando Cortez.' It made its appearance in 1843, and was received with the same enthusiasm as its predecessor. In 1847 Mr. Prescott brought out his celebrated work, the 'History of the Conquest of Peru, with a Preliminary View of the Civilization of the Incas.' He next devoted his great and universally acknowledged talents to the preparation of a work of much more extended range, 'The History of the Reign of Philip II. King of Spain;' the first two volumes of which appeared in the latter part of 1855. In 1856 he published an edition of Robertson's 'History of the Reign of Charles V.,' accompanied with notes, and a valuable supplement, containing an interesting account of the Emperor's life after his abdication. In 1858 appeared his third volume of the 'History of Philip II.;' but death arrested his career, and put a stop to his completion of that important work. He died at New York, 28th January, 1859. The Boston *Courier*, in speaking of this sudden event, pays him the following encomium:—'The highest possible acknowledgments of literary distinction were liberally showered upon Mr. Prescott. The University of Oxford, in 1850, conferred upon him the degree of Doctor of Laws. In 1845 he received the highest of all distinctions of its class, in being elected a corresponding member of the class of moral and political philosophy in the French Institute. Of most of the learned societies in Europe he was a member. Mr. Prescott was as rich in the love of his friends as in the admiration of the literary world. No man was ever more warmly beloved; no man could show a better title to the affections of his friends.'

PRIESSNITZ, VINCENZ, the founder of the Water-cure system of medical treatment, known as Hydropathy, was born at Grafenberg, in Austrian Silesia, in 1799. In youth he was a working farmer, with a very limited education. But receiving a very serious contusion from a cart passing over him, he was laid on a bed of sickness for a considerable period, when he was induced, in order to allay the inflammation arising from his accident, to try the process of cure by cold water, which proved so successful, that on his recovery he applied the same treatment to other cases of inflammatory disease. He then devoted himself to the study of medicine, and at length succeeded in establishing cold-water baths at Grafenberg. His system became so generally patronized, that from 1829 to 1844, the number of his patients amounted to 8573; and Hydropathic establishments soon came into full operation in almost every part of Europe. He died in 1851.

PRINTING (ix. 847-9). Of late years various attempts have been made to facilitate the arrangement of printing-types, and impart more expedition to the general process than the apparently tedious one, pursued by the compositor, of picking the types, individually, out of the cells or boxes in which they are contained. About twenty years ago several composing machines were exhibited by a Mr. Young, which were intended to be worked in the manner of a piano-forte; each key of which was marked with a letter, and when struck by the operator, the type corresponding with the letter was conveyed to a long groove. The row of types then underwent the process of 'justifying,' or arranging in equal lines. Captain Rosenberg subsequently exhibited a composing machine which so far differed from Mr. Young's that each type was removed to the receiver by the action of an endless chain, instead of descending a series of channels by its own weight. Accompanying this was a *distributing* machine. Another method was introduced by Major Beniowski, in which the types were placed in small vertical and horizontal pigeon-holes, out of which they were picked by a pair of tweezers. Some other inventions were also shown at the Exhibition of 1851. One of these was by a Dane named Andersen. Each type was made to pass through a perforated circular plate, so constructed that none but the letter for which the aperture was designed could gain a passage—every letter of the alphabet having a distinctive nick with which the perforations in the circular plate coincided. But all these plans, however ingenious, have failed in their professed object, that of expediting the general business of a printing office, which, in newspapers and other periodicals, is of essential importance. They were found rather to impede than accelerate business, and, independently of their original cost, were looked upon, by practical men, as the mere abortive attempts of misdirected ingenuity. Hence they have been all rejected by the printing trade, chiefly because they are an impediment to the employment of numbers, and to the extended division of labour, of which the inventors, not being practical men, appear to have been ignorant. Thus, if a given quantity of work were required in one day, or one night, an indefinite number of compositors could be engaged, and the

labour so duly distributed as to secure its accomplishment within a given time; but the use of these composing machines would be a serious impediment to business, chiefly from their uncertain operation, and the difficulty of employing a sufficiently large number of hands. It would be impossible for even ten or twelve machines to do the work which thirty or forty skilful compositors could effect, by what is technically called 'the Line System' of printing, the rapid operations of which would be entirely defeated by the uncertain *modus operandi* of these machines.

This 'line system' is comparatively a new mode of conducting business in letter-press printing. In technical language it is called '*Clicking*,' and is especially applied to our newspaper and parliamentary printing, both of which require great expedition and regularity. But the system is not confined to these departments of printing. It has been extended to nearly all the larger and more important establishments engaged in book-printing and other miscellaneous kinds of business.

It was formerly the custom for compositors' work to be individualized; when each person did that portion which was assigned him by the overseer, who paid him for the number of pages, or the quantity of matter he had done, without any regard to the charges of his fellow workmen. But inconveniences were found to exist, and the want of general co-operation frequently impeded business. Hence the necessity arose of adopting what is designated 'the Line System.' By this plan several compositors, from three to an indefinite number, may be formed into a general companionship, under the direction of one of their own body, who is selected for the management of the whole; and he performs those duties which formerly devolved on the overseer. He takes charge of the copy, divides it among the compositors, gives his orders, makes up the matter, and writes the general bill. He is responsible for the correctness of the charges, and for any *horse* (or charges on account) that may be written. The companionship, of which he is at the head, is not formed for one particular job, as formerly, but is at all times ready to receive any species of work which the overseer or employer may consign to it. In making up the earnings for work done, the plan is for each compositor to charge by *lines*, whence the system derives its name. These lines are reduced to *hours*, 1000 letters being calculated for each hour. Thus, if we have a solid 8vo work, consisting of 40 lines in a page, and 21 ems wide, we shall find that it requires 24 lines to make up 1000 letters; and we should therefore fix upon that number of lines as one hour's work. Proceeding upon this basis, the compositor would charge his quantity of hours, which would be ascertained by dividing his full number of lines by 24. We will suppose that the charge per sheet is 16*s.* including notes; this will make 32 hours at 6*d.* per hour. It will be evident that as there are only 40 lines in a page, according to the ordinary practice, there would be only 20 lines per hour; but this, of course, includes the making up, notes, and imposing, which, according to the line system, is done by the clicker. In the sheet there are 640 lines, independently of heads and whites; and if we divide this number by 24, we shall find that the compositors have only charged 27 hours instead of 32. Thus there will be five hours to the good to be allowed to the clicker for making up, setting notes, heads, white lines, imposing, &c. If he does all this in precisely five hours, the work will neither be *fat* nor *lean*; but if he exceeds that time (say two hours) the price per hour would be reduced to nearly 5½*d.* If, on the contrary, the clicker did the work in three hours, then two would be saved to the companionship; which, added to the price per hour, would raise it to nearly 6½*d.*

If, however, all the works in a printing-office were of the straightforward and solid description just mentioned, there would be little necessity for adopting the line system; for in these cases every man can readily make up his own matter, and little loss of time is experienced; nor would the system afford much advantage one way or the other. But when various works are placed in the hands of the same companionship, and they are all of an irregular description, some leaded, or full of short pages, and others consist of table-work, some solid, and others very light;—when one man may be engaged on very bad manuscript, or on solid reprint, which will not pay 5*d.* per hour; and another may be on double-leaded poetry or open table-work, which may pay 1*s.* 6*d.* per hour,—the line-system is found to operate most advantageously to all parties,—to the employer by the expedition it promotes, and to the men by the equity with which the fat and the lean are fairly divided. The overseer is relieved from the constant attention to details which was formerly required, and the men are benefited by the superintendence of one individual, whose time is exclusively devoted to all the extraneous duties of casting off, making up, &c.

The system by which newspapers are conducted is not very dissimilar from the preceding. The difference is, that in exchange for all the fat, and for the trouble of pulling galleys, &c. the compositors are allowed 8½*d.* per 1000 letters, or 3*s.* 7*d.* a *galley*, as it is technically called. The printer, who has the superintendance of the paper, makes up the columns, and charges all the head lines, cuts, standing matter, &c., with which the men have no concern. The galley is reckoned at 5000 letters, which, at 8½*d.* per 1000, comes to 3*s.* 7*d.*, as above stated, within one halfpenny. This price applies to evening and weekly papers; but the morning journals are paid at 11*d.* per 1000, or 4*s.* 7*d.* per galley, which includes night-work. The charges by time on the weekly papers are 10*d.* per hour, and on the morning papers 1*s.*

In computing the number of lines to a galley, whether in Brevier, Minion, or Nonpareil, the first business is to ascertain the ems in width. Thus, if we find that the Brevier is 50 ems wide, we divide 5000 by 50; and the result will be 100 lines to a galley. If the Minion be 55 ems wide, then, according to the same process, it would require 91 lines to make up a galley; and Nonpareil, 60 ems wide, would require 84 lines, deducting one-eighth

on account of the extra payment for nonpareil, thus leaving 74 or 75 lines.

PRINTING MACHINES (ix. 351-2). For the printing of newspapers, as well as for book-work in general, several kinds of machines, of vast power and great ingenuity, have been introduced; some with horizontal cylinders; others with plattens and flat-surface printing; others with vertical revolving pillars, to which the columns of type are perpendicularly attached. This last invention, which was slightly noticed in vol. x. 852, may be considered as the wonder of the age. It has thus been described by the author of 'Novelties and Inventions:'—'The monster machine at "The Times" office has the type ranged round the surface of a cylinder more than five feet in diameter; or, more correctly, the surface is a polygon, each side of the polygon being equal to the width of a column. This type-cylinder rotates, and presents its several polygon facets to the sheets of paper. The inking-rollers are vertical, and they feed themselves from a reservoir, which is also vertical. There are eight cylinders, about a foot in diameter, round each of which a sheet of paper coils itself; eight boys place the sheets upon stands or platforms, and the eight sheets are drawn down and made to wrap round the eight cylinders. The inking-rollers receive their quantum of ink; they touch the types as the type-cylinder rotates; the paper-cylinders press the paper against the inked types; the printing is effected before the spectator can well tell what has become of each sheet; and the eight printed sheets fall from the eight cylinders, and are received by eight boys who are seated at the lower part of the apparatus. In this most beautiful machine, Mr. Applegath, the inventor, undertook to provide a power adequate to print 8000 copies per hour; but he conceived it probable that, by a few slight improvements, such a machine might attain a speed of 10,000 or 11,000; and more than this increase has since been obtained.'—Indeed, a similar machine is now employed in printing the 'Illustrated London News' with additional capabilities; and what is still more extraordinary, a machine of American invention is now employed on 'Lloyd's Weekly Newspaper,' which prints fourteen or fifteen thousand per hour. Such is printing, and such are the wonderful powers of inventive genius, brought into operation for the general diffusion of useful knowledge:—

> 'Aided by thee, O art divine, our race
> Spurns the opposing bounds of time and space;
> With Fame's swift flight to hold an equal course,
> And taste the stream from reason's purest source.'

PRIODON'TES (Gr. πρίων a saw, and ὀδοντες teeth, from the serrated appearance of their teeth), a subdivision of the Armadillos, of which *Prionus* is the type.

PRION'IDÆ, a family of capricorn Coleopterous insects, the body of which is robust and thick.

PRI'ONOPS (Gr. πρίων a saw, ὄψ the face), a genus of birds belonging to the Shrikes.

PRISONS, and PRISONERS. [TRANSPORTATION, ix. 234-42]. In a recent report issued by the inspectors of convict prisons, it is calculated that out of 1000 prisoners sentenced to transportation for life, 113 can neither read nor write, 135 can read a little, 291 can do both imperfectly, 380 can read well, and 81 are of superior education. Of another 1000 prisoners, about 15 or 16 appear to have been liberally educated and employed; 40 to 52 have been clerks, shopmen, and bagmen; 26 to 71 servants; and 317 to 388 tradesmen and mechanics. Of 1000 convicts released from the Model Prison of Pentonville, it was computed that 200 relapse into crime; 300 abandon it; 400 adopt a good course of life; and 100 break down as permanent invalids. The report on Milbank Prison showed that 2765 prisoners were disposed of, and the expenses amounted to 29,675*l.* Of 2259 convicts, whose educational *status* is recorded, only 243 were utterly ignorant. At Parkhurst Prison 638 prisoners were disposed of, and the cost was 11,140*l.* At Portland, 2387 prisoners were disposed of, and the expense amounted to 52,161*l.* At Portsmouth, 1636 prisoners were disposed of, and the expense was 31,335*l.* At Dartmoor, 1517 prisoners were disposed of, and the expense was 34,454*l.*

PRISTI'NÆ (Gr. πρίζω to saw), a sub-family of the *Squalidæ*, of which the *Pristis*, or Saw-fish, is the genus. The snout has the appearance of a sword-shaped plate, armed with spines.

PRISTIU'RUS (Gr. πρίζω to saw, and οὐρος a tail), a genus of Shark, of the family *Squalidæ*.

PRIVY COUNCIL (ix. 855). At the head of the Privy Council Office is the Lord President of the Council, who presides over one of its committees—the important one on education. He is usually a peer, and always a member of the cabinet. He has a salary of 2000*l.* a year, and is in possession of considerable patronage. The Vice-President of the Council is also a political officer, with 1200*l.* a year. The staff of the Privy Council, in addition to the Lord President and Vice-President, are the two Clerks of the Council, one at 2500*l.*, and the other at 1200*l.* a year; registrar, 1000*l.*; chief clerk and receiver of fees, 815*l.*; first clerk, 700*l.*; receiver of clergy returns, 500*l.*; private secretary to the Lord President, 300*l.*; four clerks, from 250*l.* to 600*l.*; besides chamber-keepers, messengers, porters, &c.

PROBATE, COURT OF. [DIVORCE, COURT OF, *Suppll.*] By Statute 20 & 21 Vict., c. 77, probates of the wills of testators, and the right of granting letters of administration of the effects of persons dying intestate, have been removed from the Prerogative Court, and vested in a newly-established jurisdiction called the Court of Probate, the judge of which is styled "the Judge Ordinary." The office or registry in which probate or letters of administration are to be sought, is now determined by the place where the deceased had a fixed abode at the time of his death, and not by the locality of the *assets* of the person deceased. Original wills, proved in the country, are now preserved in the district registries; but copies are to be forwarded to the principal registries in London, for the purpose of convenient research. The rules of evidence in this court are the same as those in courts of law and

equity; and the practice, in all disputed matters, is thrown open to the whole of the legal profession. An appeal from the decision of the judge lies to the House of Lords. In cases where a person dies, leaving real property under 300*l.*, or personal property under 200*l.*, and litigation arises, the county court of the district has the power of adjudicating; but an appeal from its decision lies to the Court of Probate, whose decision is final.

PROBOSCID'IANS (Lat. *proboscis* a snout, or trunk), a family of Mammalian Pachyderms, as the elephant, mastodon, &c.

PROCELLA'RIA (Lat. *procella* a storm), the Petrels, a genus of birds belonging to the Gulls, of the family *Alcadæ*.

PROFESSIONS AND OCCUPATIONS. [TRADES, &c., *Supplt.*]

PROPAGAN'DA (Lat. *propago* to propagate), a religious society established at Rome by Gregory XV. in 1622, for the diffusion of Christianity, according to the Romish doctrines, throughout the world. It is composed of cardinals and special agents of the Pope, whose business is chiefly to superintend and aid the Roman Catholic missionaries wherever they may be located. The term *Propagandists* has been applied to political societies of a liberalizing tendency.

PROPERTY TAX. [INCOME AND PROPERTY TAX, *Supplt.*] A recent return to the House of Commons thus sets forth the amount of property assessed for the year ending April 5, 1857, under Schedules B (profitable occupancy of lands, &c.) and D (profits and gains of trade). In the counties (exclusive of the boroughs) the returns stand thus:—England and Wales (B), 38,726,809*l.*; (D), 17,845,658*l.* Scotland (B), 5,809,932*l.*; (D), 2,316,169*l.* Ireland (B), 2,497,751*l.*; (D), 1,321,627*l.*—total counties (B), 47,034,552*l.*; (D), 21,483,454*l.* The returns for the boroughs give the following:—England and Wales (B), 2,459,535*l.*; (D), 55,666,269*l.* Scotland (B), 122,224*l.*; (D), 8,792,980*l.* Ireland (B), 84,787*l.*; (D), 3,256,247*l.* It appears, therefore, that the annual income derived from the occupancy of lands, &c. (farming), is 49,701,098*l.*; while the profits of trade are 89,198,950*l.*

PROSCRIPTION (Lat. *proscribo* to post up in writing, or to outlaw), a punishment among the Greeks and Romans, which was somewhat equivalent to our modern practice of outlawry. Sylla proscribed 2000 knights and senators at once. The Cornelian law mentions a kind of proscription that forfeited the lands of the proscribed to the government. In modern times, the term has been applied to the forcible levy of soldiers for the service of the State, a custom which the late Emperor of France carried to a most tyrannous extent.

PROTEA'CEÆ (from the god *Proteus*), a natural order of Exogenous plants, consisting of shrubs and small trees, the type of which is the genus *Protea*.

PROTEAN STONE is the name of a beautiful artificial material manufactured from gypsum, which is made to resemble granite, ivory, or different sorts of marble. Mr. Cheverton is the inventor. The colour is very brilliant, and susceptible of a very high polish. The material may be tinted throughout the entire mass. The colouring is effected by dissolving the requisite pigments in water, and immersing the article to produce a uniform stain. Its use has been applied to various ornamental articles, such as finger-plates, letter-weights, inkstands, door-handles, &c.; and very beautiful some of them appear.

PROTOZO'A (Gr. πρῶτος first, and ζωὴ life), a term applied by zoologists to those substances which exhibit the dawning symptoms of animal life, or where it is doubtful whether they ought to be classed in the vegetable or animal kingdom.

PROUT, SAMUEL, a distinguished landscape painter in water colours, was born at Plymouth, in 1783. He first commenced his career as an artist under Mr. Britton, the antiquary, whom he accompanied in his western tour, when collecting materials for the 'Beauties of England.' In 1805 he visited the metropolis; and the first patron he there found was Mr. Palser, the printseller of Fleet-street, who was in the habit of purchasing his sketches. In 1816 he brought out a series of 'Studies,' which was followed by 'Views in the North and West of England,' 'Rudiments of Landscape,' &c., all of which met with tolerable success. He afterwards made the tour of the fairest portions of France, Germany, Switzerland, and Italy, of which he afterwards published a series of Sketches in 1839, which, in addition to numerous other clever pieces, contributed to establish his fame as one of the first and most original of our old school of painters in water colours. He died in 1850.

PROUT, DR. WILLIAM, Fellow of the College of Physicians in London, F.R.S., &c., was born in 1787. He was brought up to the medical profession, and early directed his attention to the study of chemistry, of which he became a distinguished professor. His works on the various departments of chemical and medical science are numerous; but that for which he is best known is the 'Bridgewater Treatise,' entitled, 'Chemistry, Meteorology, and the Function of Digestion, considered with reference to Natural Theology,' of which numerous editions have been published. He died in 1850.

PSEUDOBRANCHUS (Gr. ψευδὴς false, and Lat. *branchiæ* gills), a genus of Batrachian reptiles, including the Sirens of Linnæus.

[The Greek word *Pseudes* (false) is of frequent occurrence in science and art, when applied to words which have only the semblance and not the reality of the things represented; as *Pseudocorystes*, a genus of Decapod Crustaceans, of the family Brachiura;—*Pseudoliva*, a genus of Mollusca, of the family Turbidæ;—*Pseudoperipteral*, a term applied in architecture to those temples in which the side columns were inserted in the wall, and where there was no portico, except to the front façade;—*Pseudopods* (false-footed), a tribe of Polygastric Infusoria;—*Pseudopus*, a genus of serpents belonging to the Slow-worm family;—

Pseudoscorpiones (false scorpions), a family of Arachnidians.]

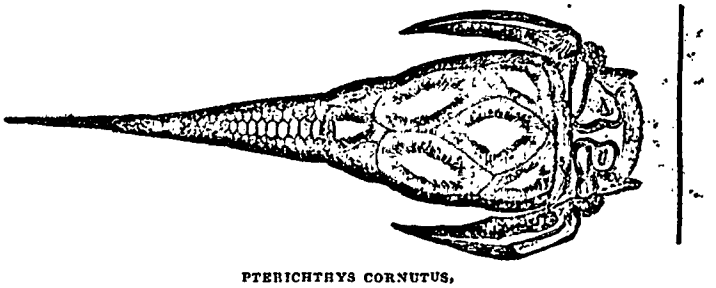
PSILOCEPH'ALUS (Gr. ψιλὸς slender, or naked, and κεφαλὴ a head), a genus of fishes, of the family *Balistidæ*.

PSILOMEL'ANITE (Gr. ψιλὸς, and μέλας black,) a mineral of a dark, steel-grey colour, and dull metallic lustre, found in Cornwall and different parts of Germany; specific gravity, 4·0 to 4·15; hardness = 5·0 to 6·0. Its constituents are—red oxide of manganese, baryta, oxygen, and a small portion of silica.

PSILOSTOM'ATA (Gr. ψιλὸς, and στόμα mouth), in zoology, the third family of Blainville's order *Aporobranchiata*.

PSITTAROS'TRA (Lat. *psittacus* a parrot, and *rostrum* a bill), a genus of granivorous birds placed between the Bullfinches and the Crossbills.

PTERICH'THYS (Gr. πτερὸν a wing, or fin, and ἰχθὺς a fish); a genus of fishes with very long pectorals, which extend to the base of the caudal, whence the term *winged fishes*. In geology Pterichthys is the name given by Agassiz to a very singular genus of ganoid fossil fishes, found in the Devonian and old red sandstone formation. These uncouth-looking monsters, which are covered with bony framework, appear to have been the most numerous, if not the exclusive inhabitants of that early period of the earth's crust. Professor Ansted has given some interesting notices of a particular species of this wing-fish, called the *Pterichthys cornutus*, of which the annexed is a representation.



PTERICHTHYS CORNUTUS,
(Of the old red sandstone formation.)

'This animal,' says Professor Ansted, 'was one of a group remarkable for the large size of the bony plates compared with that of the animal, and also for the distinct and peculiar forms of such plates. There were also bony coverings to the fins, and a projecting tail, giving the appearance of a winged animal, although there cannot be a doubt that the flesh-like character was perfect. Several species, also enveloped in hard cases, but more like the existing tribes, accompanied the Pterichthys; and there was also one, the *P. coccosteus*, so called from the berry-like tubercles with which the large bony plates were covered, and of which numerous fragments have been obtained, chiefly from the flagstones and other beds of the old red sandstone of Scotland.'

[In Ichthyology, the Greek word *Pteron* (a fin or wing) is of very frequent occurrence in designating different long-finned genera; as *Pteridium*, of the family Gadidæ;—*Pterocephalinæ*, a subfamily of flat-fishes;—*Pteroceres* (the Scorpion shells), a genus of Mollusca of the family Strombidæ;—*Pterois*, *Pteroleptus*, and *Pteropterus*, all of the family Scorpænidæ;—*Pteroplatea*, a genus of flat-fishes of the Raidæ family.—The word *pteron* is also of frequent use as a prefix in Ornithology and Botany.]

PTER'OMYS (Gr. πτερὸν, and μῦς a mouse), a genus of Rodents, the Flying Squirrels.

PUGIN, AUGUSTUS, the eminent architectural draftsman, and author of 'Specimens of Gothic Architecture,' was a Frenchman by birth; but at an early age he settled in London, and obtained regular employment as a draftsman. He was engaged in many important works, with which his name is still intimately associated. Among others, he brought out 'A Series of Views in Islington and Pentonville;' 'Architectural Illustrations of the Buildings of London,' in conjunction with Mr. John Britton; 'Specimens of the Architectural Antiquities of Normandy;' 'Paris and its Environs displayed;' 'Gothic Ornaments, selected from various Buildings in England and France,' &c. He died in 1832.

PUGIN, AUGUSTIN W. NORTHMORE, son of the preceding, author of 'Designs for Gothic Furniture in the Style of the Fifteenth Century,' was born in 1811. He was early instructed by his father in the principles of architectural drawing; and first obtained distinctive employment, under the celebrated Messrs. Grieves, in theatrical scene-painting. Having joined the Roman Catholic Church, and found a kind patron in the Earl of Shrewsbury, he devoted his energies to the ecclesiastical architecture of the Middle Ages. His productions soon attracted public attention by the superior talents exhibited in this line of art; and he was engaged in the designing and forming of a larger number of Roman Catholic edifices than has fallen to the lot of any other Englishman. Specimens of his artistic skill may be seen in almost every county and principal town of the kingdom. But independently of his practice as an architectural draftsman, he closely devoted his attention to literary matters. In 1841 he produced a treatise on the 'True Principles of Pointed or Christian Architecture;' in 1844, a 'Glossary of Ecclesiastical Ornament; in 1849, 'A Treatise on Floriated Ornaments;' and in 1851, 'A Treatise on Chancel Screens,' &c. But at length

his mental faculties, from excessive labour, began to give way; and he expired at Ramsgate in 1852.

PUMPS, CENTRIFUGAL. These are very ingenious contrivances, and in many respects more effective than the valve-pumps. They are so contrived as to raise water by the revolution of a small wheel, by which the fluid gains admission to the centre of a rapidly-revolving box; channels convey the water from the centre towards the circumference; and it is then driven thence up a vertical tube left open for its reception. There are two kinds of these pumps, one the invention of Mr. Bessemer, and the other of Mr. Appold. In the former the axis of the box, drum, or disc, is vertical; while in the other it is horizontal; but the principle of action is nearly the same in both cases.

As compared with ordinary pumps, these centrifugal machines, says the author of 'Novelties, Inventions,' &c., 'are best adapted to the movement of a great body of water to a small height; whereas valve pumps are better fitted for forcing water to a great height, rather than in large quantity. Mr. Appold's pump raises a remarkably large body of water with a comparatively small power. With a hollow cylinder twelve inches in diameter by three inches deep, to which a rotation of 800 times in a minute is given by a steam engine, this little machine can raise 1800 gallons of water per minute to a height of ten feet. In November 1851, one of these pumps was set to work to assist in draining Whittlesea Mere. The cylinder was four feet and a half in diameter, and was immersed in one of the channels or cuts by which the Bedford Level is intersected. A steam engine was erected on the spot, and steam power applied to the turning of the cylinder. Up rose the water, and poured into a channel prepared for it, in immense volume. If raised just sufficiently to escape from its former channel, it rose in greater quantity than if forced up to a greater height. No less than sixteen thousand gallons of water per minute were raised by this means, all of which passed through the cylinder of the machine.'

PUNJAUB (Hindust. *the five rivers*), an extensive territory lying north-west of Hindustan, and consisting of that portion of country which is watered by the five great affluents of the Indus. It lies between the 29th and 34th degrees of N. lat., and 70th and 77th E. long.; and comprehends an area of about 60,000 square miles. In 1849 the Sikhs entered into a formidable struggle with the British, and were signally defeated by Lord Gough, when the whole of the territory was annexed to the British empire. [HINDUSTAN, vii. 213, and *Suppl.*]

PUSEY, PHILIP, brother of the Rev. Dr. Pusey, and President of the Royal Agricultural Society, was born in 1799. Having succeeded, as eldest son, to the Pusey estates in Berkshire, he was elected member for Chippenham in 1830, and in 1834 for the county of Berks, which he continued to represent until 1852. His knowledge of agricultural matters was very extensive. He was a regular contributor to the pages of the 'Agricultural Journal;' and in 1854 was elected President of the Royal Agricultural Society of England; whose Journal he edited for many years. He died in 1855.

PYCNODON'TES (Gr. πυκνὸς thick, and ὀδοντες teeth), an extinct genus of fossil fishes, which occur abundantly in the Oolitic formation.

PYCNOGON'IDÆ, spider-looking creatures found on the Cetacea, and on marine plants. They belong to the family of the Entomostraca.

PYRAL'OLITE (Gr. πῦρ fire, ἄλλος another, and λίθος a stone), a mineral found in flat rhombic prisms, both massive and crystallized; specific gravity, 2·55; hardness = 3·5; constituents—silica, magnesia, alumina, lime, peroxide of iron, and protoxide of manganese.

PYRARGILLITE (Gr. πῦρ fire, ἄργιλλος white clay, and λίθος stone), a mineral which occurs massive, and emits an argillaceous odour when heated; whence its name. Its specific gravity is 2·50; hardness = 3·5; constituent elements—silica, alumina, oxide of iron, magnesia, potash, and soda.

[The Greek word *Pyr, pyros* (fire), is a prefix to numerous scientific terms, especially in chemistry and pathology, which always convey the idea of fire or heat, as *Pyro-acids, Pyrophosphoric* acid, *Pyroligneous* acid, *Pyrolithic* acid, *Pyromalic* acid, *Pyromucic* acid, *Pyrotartaric* acid, &c. The word is also in very frequent use in mineralogy as a prefix to compound words; and more especially applied to those minerals which have red or fiery characteristics; as *Pyrochlore* (greenish-yellow);—*Pyrolusite* (fire-washing), the most important of all the ores of manganese;—*Pyrope* (fiery-eyed), a species of red garnet; *Pyrophane* (appearance of fire);—*Pyrophyllite* (fire-leaf-stone), which, when heated, exfoliates into white leaves, and increases to about twenty times its original bulk; *Pyrophysallite* (fire-air-bubble stone), a variety of topaz; *Pyrorthite, Pyroskelerite, Pyrosmallite, Pyrrhite*, &c.]

PYROTECH'NY, or PYROTECH'NICS (Gr. πῦρ fire, and τέχνη art), in a military sense the science of applying gunpowder and fire in manufacturing the implements of modern warfare; but in the commonly-received acceptation the term is applied to the art of making fireworks, which are not only used as signals of joy or distress, but as displays for the amusement of the public on festive occasions. To produce the various colours and devices which are exhibited by these fireworks requires considerable knowledge and experience of the art. Gunpowder, however, is the principal ingredient, which is composed of charcoal, sulphur, and saltpetre. The various colours exhibited in fireworks consist of different materials, with which the pyrotechnic artist is perfectly familiar. Thus strontian produces a brilliant crimson; zinc and antimony, a bluish white; salts and oxides of copper, blue and green; iron filings and borings give fine stars; camphor and benzoin yield odorous fumes and white fire; and hard wood sawdust produces the golden rain.

The due proportions and proper commixture of the respective materials constitute the chief secrets of the pyrotechnic art. Of this the following table will give an approximate idea; previously observ-

ing that each material is to be powdered separately in a mortar, and finally mixed with the hand.

Table of materials used for the production of different pyrotechnic colours, specifying their respective parts in weight.

Blue—Burnt alum, 6 parts; carbonate of copper, 6; sulphur, 8; chlorate of potash, 30.

Crimson—Sulphur, 8; carbonate of strontia, 12; chlorate of potash, 30.

Green—Boracic Acid, 5; sulphur, 8; chlorate of potash, 35.

Orange—Chlorate of potash, 26; sulphur, 7; chalk, 16.

Purple—Chlorate of potash, 30; sulphur, 8; chalk, 12.

White—Saltpetre, 30; sulphur, 10; charcoal, 1.

Yellow—Sulphur, 8; dried soda, 12; chlorate of potash, 30.

The mathematical part of pyrotechny consists in calculating the size of the aperture, as well as the length and diameter of the several parts of what is called a piece; and if this be not done with the greatest nicety, the various subdivisions of a piece do not take fire at the appointed moment. In works upon the subject various tables are given, in order to facilitate these calculations. The weight of the poise stick, and its length, have also to be regulated to suit the size of the tube and weight of the rocket.

For pyrotechnical displays the gunpowder is used in the form of a fine flour, commonly called meal powder, while for the 'shooting iron' the gunpowder is formed into fine grains, like seed. The mere difference in the mechanical state of the ingredients causes a great difference in the way it burns. In the grain, as ordinary gunpowder, it 'goes off with a bang;' but in the meal it merely burns with a 'fizz.' Thus a rocket is filled three parts with meal powder, and the end or fourth part with grain powder; and it is this latter which explodes when the rocket is high in the air. To produce a given effect the case is sometimes filled three parts with meal powder, and the fourth with plain gunpowder, mixed with pellets made of the colour-giving material and chlorate of potash.

PYRRHULI'NÆ, a sub-family of the *Fringellidæ*, of which the *Pyrrhula*, or Bull-finch, is the genus.

PYRULI'NÆ (Lat. *pyrum* a pear), in conchology, a sub-family of the *Turbinellidæ*, of which the shell is pyriform. The genus *Pyrula* is the type of this family.

Q.

QUADRAGES'IMA (Lat. *the fortieth*), a period of the year set apart for the observance of Lent, as indicated in the Calendar; and so called because it consists of forty days. Thus Quadragesima Sunday is the first Sunday in Lent, and about the fortieth day before Easter.—In the Middle Age, *Quadragesimals* were offerings made to mother church about the middle of Lent.

QUANG-SI, an inland province of the south of China, the population of which, according to Sir G. Staunton, is 10,000,000. Quei-ling is the capital. It is watered by several rivers; the land is well cultivated; and there are several valuable mines, one of which is a gold mine.

QUANG-TONG, an extensive province of China, of which Canton is the capital. It is bounded E. by Kiang-si and Fo-kien, S. by the ocean, and W. by Tonquin. The population was estimated by Sir G. Staunton at 21,000,000; but the census of 1852 shows it to be much more. The country abounds in silk, pearls, precious metals, quicksilver, tin, brass, iron, saltpetre, odoriferous woods, fruits, lemons of extraordinary size, and almost everything that can contribute to the necessities and enjoyments of the inhabitants.

QUARTER-DECK, in naval matters, that portion of the upper part of a ship between the main and mizen masts, which, in a man-of-war, is the usual parade for the captain and commissioned officers.

The term *Quarter*, combined with some other word, is in very general use in naval phraseology. Thus, *Quarter-gallery* is a small balcony on the quarter of a ship, which generally communicates by doors with that on the stern.—*Quarter-bill* is a written list containing the different stations where the officers and crews are to take post in time of action.—*Quarter-gunner* is a petty officer under the direction of the gunner of a ship of war. One of these quarter-gunners is allowed to every four guns.—*Quarter-men* are officers under the master shipwright, who are appointed to superintend the workmen in repairing ships of war.—*Quarter-rails* are narrow moulded planks, reaching from the top of the stern to the gangway, and serving as a fence to the quarter-deck.—*Quarter-netting* is a kind of network extending along the rails on the upper part of a ship's quarter.—*Quarter-wind* is a wind that blows directly on the ship's quarter. (Craig.)

QUARTER-MASTER, the officer of a regiment, whose duty it is to attend to the quarters for the soldiers, their provisions, forage, &c. His rank is that of a commissioned subaltern officer; but he is almost invariably promoted from the ranks, after having risen through the different non-commissioned grades to the rank of quarter-master, sergeant, or sergeant-major; consequently

the commission of a quarter-master is not purchaseable. The daily pay of a quarter-master in the cavalry is 8*s*. 6*d*.; and in the infantry, 6*s*. 6*d*.; with 2*s*. extra per day after ten years' service. As to half-pay, he is on the same footing as a subaltern officer.

QUARTER-MASTER-GENERAL, in military matters, an officer of some importance, whose business in the field is to plan and regulate the marches and encampments of an army; to ascertain and lay down the peculiar features of the localities through which the troops are marching; to fix upon the head-quarters, and places for the artillery and baggage; and to procure supplies of provisions, forage, &c. What a simple quarter-master's duties are in a regiment, the quarter-master-general's business is for the whole army. He conducts all the correspondence on the above matters, and issues the routes for the march of troops; and he is presumed to be conversant with all subjects relating to military science, and more especially with the geography and topography of the country through which the army is passing.

QUARTERS, in military matters, a term applied to the stations or lodgings assigned to soldiers. Thus the *Head-quarters of an army* is the place where the commander-in-chief has his quarters, and the *Regimental Head-quarters* is the station, generally in some town, where the colonel or commanding officer of a regiment may be quartered, with his staff of officers. *Barracks* are quarters assigned to particular regiments; and the apartments occupied by an officer in barracks are called 'quarters.' These barracks exist in different parts of the country, as quarters for soldiers, especially in the larger towns. Thus in the metropolis there are the Wellington barracks, St. James's Park; the Cavalry barracks, Knightsbridge; Albany barracks, Regent's Park; St. George's barracks, Trafalgar-square; Portman-street barracks; St. John's Wood barracks; City Road barracks, the Tower of London, &c.

QUARTER-SESSIONS, in law, a general court held quarterly by two or more justices of peace of each county. Their jurisdiction extends to misdemeanors, trespasses, minor felonies, and removals of the poor. Into this court appeals against the decisions of the local magistrates are frequently brought. By statute 2 Henry V., c. 4, these sessions were appointed to be held in the first week after Michaelmas-day, the first week after the Epiphany, the first week after the close of Easter, and in the week after the translation of St. Thomas the Martyr, or the 7th of July. In many corporation towns there are quarter-sessions kept before justices of their own within their respective limits, which have usually the same authority as the general quarter-sessions of the county.

QUATREMERE DE QUINCY, ANTOINE C., a distinguished archæologist, and secretary of the 'Académie des Beaux Arts,' was born at Paris in 1758. He was the author of various works connected with antiquities and the fine arts; but constantly involved in the troubles and political changes in France. He began his 'Dictionnaire d'Architecture' in 1786, which he did not complete till 1828. In 1790 he published 'Considerations sur l'Art du Dessein en France;' and the same year was elected a member of the Legislative Assembly; but during the Reign of Terror he was thrown into prison, where he remained for thirteen months. In 1797 he was elected to the Council of Five Hundred. Being denounced by the Directory, he was obliged to fly from the country; but was allowed to return after the elevation of Bonaparte to power. On the return of the Bourbons, Louis XVIII., in 1815, appointed him to the office of 'Intendant-général des Arts et des Monuments Publics, Censeur Royal,' &c. The following year he became a member of the Institute, and was appointed perpetual secretary of the Académie des Beaux Arts. He soon afterwards withdrew from political life, and almost exclusively devoted himself to literary pursuits. He was the author of numerous works, which, though not of the highest standing, hold a very respectable position in the republic of letters; among others may be mentioned 'De la Nature, du But, et des Moyens de l'Imitation dans les Beaux Arts' (1823); 'Lives of Raphael, Canova, and Michael Angelo' (1824–1835); 'Monumens et Ouvrages d'Art Antique restitués d'après les Inscriptions des Ecrivains Grecs et Latins' (1826-9), &c. He died in 1849, aged 91.

QUEBEC (ix. 1001). The commerce of the city of Quebec has become very extensive. It engrosses nearly the entire trade of the province. The value of the imports in 1851 amounted to 642,804*l*.; and of exports, to 1,593,662*l*.; the amount of duties collected was 92,840*l*. The number of vessels which arrived in 1852 was 1055; and in 1853, 1193, with 36,113 passengers. The city is divided into six wards, and governed by a mayor and nineteen councillors, who are elected by householders owning a real estate of twenty dollars, or paying an annual rental of forty-five dollars.

QUEENS TOWN, a sea-port of the county of Cork, in Ireland, formerly known as the Cove of Cork (iv. 946), but changed to its present name, in commemoration of her Majesty's visit to Cork. From the great resort of the royal navy it has now become a large handsome town, with a magnificent quay, and every convenience for ships. The population in 1851 was estimated at 11,428.

QUINCITE, a mineral occurring in the limestone deposits which exist in the neighbourhood of Quincey, in France; whence the name was derived. It is of a fine carmine colour; and consists of—silica, 54; magnesia, 19; protoxide of iron, 8; water, 17.

QUINO'A, an edible grain, of very general use in Chili and Peru. It is a small round seed, of which there are two varieties,—the one bitter, and the other sweet. It is ground into flour, and converted into bread, the same as the farinaceous productions of our own country. It is something like oatmeal, and very nutritious; the constituent elements being—starch, 60; gluten, 19; fat, 5; and water, 16.

The plant which produces this nutritious grain is of the genus *Chenopodium quinoa*, so called

from the Greek χὴν a goose, and πόδες feet, in reference to its having leaves similar to the webbed feet of the goose.

THE QUINOA PLANT.

It grows at an elevation of 13,000 feet above the level of the sea, where barley and rye would not ripen. The grain it produces, like the rice in India, constitutes the principal food of the thousands of inhabitants of the elevated regions of the Andes, without which these lands would be little more than scanty pastures for cattle.

QUINTAIN (Fr. *quintaine*, Welsh *gwyntyn*), in the Middle Age, a sport or exercise derived from the Romans, which was practised by men on horseback, to test their agility and skill. The quintain was an upright post, on the top of which turned a crossed pole. On the one end of this was placed a broad board, and on the other a sand-bag. The object of the game was to ride against the broad end with a lance, and dash past without being struck by the sand-bag behind. There was also the quintain against an armed man, who parried the blow with his shield, and acted on the defensive. The exercise called 'Running at the Quintain' was described by Matthew Paris in 1253. It was a species of tilting at a mark made in the shape of a man to the navel. In his right hand he had a wooden sword, and in his left a shield. The whole was made to turn round; so that the figure, if it was struck with a lance in any other part than full in the breast, turned round, and struck the horseman with the sword in its right hand. In later periods, when the Ottoman arms were triumphant throughout the East, the quintain figure was sometimes represented as a Saracen or Turk, which turned round on a pivot, and if not hit dexterously struck the player with the sabre or club which it held in the right hand. (Du Cange.)

QUINTANA, MANUEL JOSE, one of the most distinguished Spanish poets of modern times, was born at Madrid in 1772. He was educated at the University of Salamanca, where he took his degrees in civil and canon law, and afterwards practised as an advocate at Madrid. His political opinions were of the most liberal cast, and in direct opposition to Godoy, the royal favourite of the day. In 1795 Quintana became known as a poet, having produced some of the finest pieces of the language, especially his 'Ode to the Sea,' written on his first visit to Cadiz. In 1807 he brought out the first volume of the 'Lives of celebrated Spaniards.' On the invasion of Spain by the French, Quintana became their great literary antagonist. He was the author of most of the manifestoes of the insurrectionary juntas; and edited a periodical, entitled 'El Semanario Patriotico,' which was the principal organ of the patriotic party. During the six years' struggle with the French, he was looked upon as one of the most energetic supporters of the patriotic cause. On the return of Ferdinand VII., however, he was suddenly seized, and thrown into the fortress of Pampeluna; from which he was not released until the outbreak of Riego's insurrection in 1820. After the second invasion of the French, who succeeded in overthrowing the Spanish Cortes, Quintana was commanded to leave the capital, when he retired to Cabeza del Buez, in Estremadura, where he lived in retirement and poverty for some years. On the marriage, however, of King Ferdinand to his third wife, Maria Christina, in 1828, he received an intimation, that he would be permitted to return to Madrid, if he would write an ode in celebration of the royal nuptials. This offer, to the surprise and regret of all his patriotic admirers, he condescended to accept; and soon afterwards found himself once more on the high road to fortune. He received several honourable and profitable appointments, and was at length made a senator, and elevated to the peerage of the kingdom. So gratified was the court party at the subserviency Quintana had displayed, and the talents he employed in their cause, that public honours were conferred upon him. He was conducted in grand procession through the principal streets of Madrid, introduced to the Cortes, and a laurel crown publicly placed on his head by the Queen of Spain. He did not long survive these honours. He died in March 1857, aged 85; and his funeral was attended by most of the literary men of distinction in Madrid.

QUINTETTO (Ital.), in music, a vocal or instrumental composition in five parts, in each of which is an obligato, performed by a single voice or instrument.

R.

RACES OF MANKIND. [CAUCASIAN, MONGOLIAN, and NIGRITIAN, *Supplt.*]

RADETZKY, FIELD-MARSHAL, COUNT JOSEPH, the Austrian commander, was born in Bohemia, in 1766. He entered the army as a cornet in 1784; and was engaged in all the Italian campaigns against the French from 1795 to 1800. At the battles of Arcola, Rivoli, Novi, and Marengo, he greatly distinguished himself. In 1800 he received the rank of colonel, and was soon afterwards made major-general, with the command of the 4th corps, and the rank of lieutenant-field-marshal. In the campaign against Napoleon, in 1813, Radetzky acted as chief of the staff to Prince Schwartzenberg; and his most brilliant feat of arms was at the memorable battle of Leipsig, the plan of which was drawn up by himself. Having been engaged in the whole of the campaign in the French territory in 1814, he entered the city of Paris, riding by the side of Alexander of Russia. In 1822 Radetzky was appointed Commander-general of the Lombardo-Venetian kingdom; and in 1830 was created Field-Marshal, after forty-six years of active service. So far have we seen him as a brave and active soldier. But it was in 1848 that he rendered his name conspicuous in the annals of history. The revolution in Paris was followed by similar movements in Vienna and the Lombardian provinces. Barricades were erected in Milan, and fighting continued for three days, when Radetzky was compelled to withdraw his troops from the city, and retire to Verona. The insurgents were for some time victorious; and the King of Sardinia having joined the Lombardians, the struggle was kept up for several months, with alternate success on both sides. At length the gallant veteran advanced against Milan, at the head of the Austrian forces. The city capitulated, and the Sardinian troops were soon driven from the field. The struggle was then virtually at an end, and all Lombardy was at the feet of the Austrian general. Another attempt was made in 1849 by the Lombardians to establish their independence; but the skilful and energetic measures of the brave veteran soon rendered it abortive. In 1857, full of years and honours, he obtained permission to retire from the active duties of his profession, after having devoted seventy-three years of his life to the service of his country. He died at Milan, in 1858, aged 82.

RADNORSHIRE, Wales (x. 10–13). According to the census of 1851, the population of the county was 24,716; with 4614 inhabited houses, and an area of 425 square miles. The population of the principal places was as follows:—

Knighton . . .	1388	New Radnor . .	2345
Old Radnor (District) . . .	6653	Prestesteigne . .	1617
		Rhyader . . .	1007

RAFFLESIA'CEÆ, an order of curious parasitical plants, of the class Rhizanths, of which *Rafflesia* is the type or genus, and so called in honour of its discoverer, Sir T. S. Raffles. There are a variety of species, found on different kinds of Leguminosæ in the East Indies and South America.

RAGLAN, FIELD-MARSHAL, LORD FITZROY SOMERSET, Commander-in-chief of the Crimean expedition against Russia, was the eighth son of the fifth duke of Beaufort, and born in 1788. In 1801 he entered the army as a cornet of the 4th Light Dragoons; and in 1808 was transferred to the line as captain in the 43rd Foot. During the same year he was associated with Sir Arthur Wellesley in the Peninsula, as one of his aides-de-camp; and in 1810 was appointed his military secretary. He was present at all those brilliant actions in which that great general was engaged. At the storming of Badajoz he was among the foremost to mount the breach, and to him the governor delivered up his sword. In 1814 he was in the thick of the battle of Waterloo; and there he had the misfortune to lose his right arm. He was soon afterwards appointed Captain and Lieutenant-Colonel in the 1st Foot Guards. In 1815 he was nominated a Knight Commander of the Bath, and rewarded with a number of foreign orders. After this he was engaged in different embassies at Paris, Vienna, Verona, Petersburg, and Madrid. In 1819 he was appointed secretary to the Duke of Wellington, who was then Master-General of the Ordnance; and in 1827 he was made military secretary to the Commander-in-chief, which office he performed until September 1852. He had also sat as a member of the House of Commons in the two parliaments of 1818 and 1826. In 1852 he was appointed Master-General of the Ordnance, and elevated to the House of Peers under the title of Baron Raglan, of Raglan, co. Monmouth. In 1854 he was appointed Commander of the forces engaged in the Crimean war against Russia, and promoted to the rank of Field-Marshal. But he was soon afterwards seized with a fatal malady, arising from the anxieties and hardships of the campaign, and expired on the 28th of *June*, 1855, deeply deplored by the whole army.

RAIA'NIA, a genus of plants distinguished by the bell-shaped perianth of their flowers, and so called in honour of Mr. John Ray, the great naturalist.

RAILWAYS (x. 15–28). We have already brought the history of railways to the year 1849. Since that period their numerous ramifications throughout the United Kingdom present some important features in the general topography of the country. New towns and populous localities have sprung into existence, while many old ones are fast disappearing from the map of the king-

dom. Steam and railways are evidently leading to a great social revolution, by which the humblest members of the community, so far as the power of locomotion is concerned, are placed on a level with the first peers of the realm. What the spirit of Guttenberg and of Caxton has effected in the intellectual world, the genius of Watt and Stephenson is accomplishing in physical science. While the former is diffusing the light of knowledge through the world, the latter is giving an unwonted impulse to the powers of production, and everywhere extending the means of social prosperity and human happiness.

Among the great trunk lines of railway now in existence may be first mentioned that important one the North-Western, extending from London to Manchester and Liverpool, and thence to Carlisle, Glasgow, and Edinburgh. This is one of the greatest public works ever executed in this country. The railway from London to Bath and Bristol, and thence to Exeter, called the Great Western, is also a magnificent work, and is in many respects superior to any in the kingdom. Among the other leading railways may be specified those from London to Southampton, Brighton, and Dover; the Eastern Counties; Midland; North Midland; Great Northern; and those from Liverpool to Manchester, from Carlisle to Newcastle, from the latter to Edinburgh, from Edinburgh to Glasgow and Ayr, with a host of others. By the opening of the Chester and Holyhead Railway, the communication between London and Dublin has been greatly facilitated. The mails are now conveyed within seventeen hours, and the completion of that gigantic work—the tubular bridge across the Straits—effects a saving of one hour more. The most important addition to the railways in Ireland has been the extension of the South-Western communication from Dublin, viz. from Ballybrough to Tipperary and Limerick, by the opening of portions of the Limerick and Waterford and the Great Southern and Western railways.

From London, the great nucleus of railway traffic, there ramify six great trunk lines, viz.—the *North-Western*, which passes through Birmingham to Liverpool and Manchester,—the *Great Western*, which runs through the western counties to Salisbury, Bristol, Exeter, &c.,—the *Eastern Counties*, which branches through Cambridge, Essex, and Norfolk,—the *South-Western*, which goes to Southampton and Portsmouth,—the *South-Eastern*, which runs to Canterbury and Brighton, and branches off to Ramsgate, Margate, Dover, and Folkstone,—and the *Great Northern*, which runs through Peterborough and York to the Scottish capital. There are also the North Kent, and the North London; the Greenwich and the Gravesend, with various minor branches of railway.

The following is a synoptical statement of the length in miles of the principal railways in the United Kingdom:—London and Birmingham, 112¼; Great Western, 118¼; South-Western, 92¾; Grand Junction, 83¾; Chester and Crewe, 18; Liverpool and Manchester, 30¾; London and Brighton, 40¼; Manchester and Leeds, 51; Great Northern to York, 195; North Midland, 72¾; Midland Counties, 57; Edinburgh and Glasgow, 46; Glasgow and Ayr, 40; North Union, 22; Stockton and Darlington, 25; Stockton and Hartlepool, 15; York and North Midland, 27; Newcastle and Carlisle, 60½; Dublin and Kingstown, 6; Ulster, 25; Brandling Junction, 25; Chester and Birkenhead, 14½; Newcastle and North Shields, 7; Dundee and Arbroath, 16¾; Sheffield and Rotherham, 7½.

Railway Statistics.—The statistics of railways present many important aspects. As we have already stated (x. 27), the number of miles of railway open for traffic in the United Kingdom, in June 1849, was 5448; and there had been expended on these various works, at the commencement of the same year, 200,173,009*l.* Since that period a wonderful increase has been made. By way of comparison, we shall take the two years 1856 and 1857.

According to the statistical returns of 1856, it appears that the total length of railways, in the United Kingdom, authorized by Parliament, down to the end of that year, amounted to 14,668 miles; of these, 8635 miles were open for traffic, and 4538 remained to be opened—3316 in England and Wales, 452 in Scotland, and 770 in Ireland; and 1495 miles had been authorized to be abandoned. The total number of passengers conveyed by railway in the year was 129,347,592; and 10,153,745*l.* was received. The goods traffic yielded 13,011,748*l.* Of the goods traffic 23,823,931 tons consisted of general merchandise, and yielded 7,685,394*l.*; of minerals there were 40,938,675 tons, which gave a return of 3,585,991*l.*; of live stock there were 10,450,175 head, which yielded 517,786*l.*; and the carriage of parcels, &c., paid 1,222,628*l.* All the sources of traffic throughout the United Kingdom in 1856 yielded 23,165,493*l.* In 1855 the traffic in England and Wales amounted to 19,728,311*l.*; in Scotland, to 2,319,217*l.*; and in Ireland to 1,117,965*l.* The total amount of capital raised for the construction of railways, up to December 31, was 308,775,894*l.*, representing an expenditure of 35,459*l.* per mile of railways then open. Of this sum 77,359,419*l.* was obtained by loans, 57,057,171*l.* by preference shares, and the remainder, being 174,359,304*l.*, by the ordinary share capital.

The following are the statistical returns of the year 1857, which, on a comparison with the preceding year, afford some gratifying results, as showing the gradual but certain progress of railway enterprise.

The entire length of lines authorized by Parliament, to the end of 1857, amounted to 15,331 miles; of which 9019 miles were open, 1504 had been abandoned, and 4808 remained to be opened. The total amount of money authorized to be raised by shares and loans to the end of the year, was 387,051,735*l.*; of which 314,989,826*l.* had been raised, leaving 72,061,909*l.* to be raised. The number of passengers conveyed during the year was 139,008,888. The receipts from passengers amounted to 10,592,798*l.* The total receipts from all sources of traffic amounted in England and Wales to 20,527,748*l.*, or 3105*l.* per mile; and

in the United Kingdom to 24,174,616*l.*, or 2715*l.* per mile.

In 1858 there appears to have been a falling off in the railway receipts. The decrease of traffic in the first quarter was 167,000*l.*; in the second quarter, 252,000*l.*; and in the third quarter, 122,000*l.* In the fourth quarter there was a rally, and an increase of 113,996*l.* took place. In addition to the receipts of companies who publish their traffic returns, there are receipts of companies who do not publish them weekly, and for which an estimate has to be made. These companies' receipts amount to about 5000*l.*, on 552 miles of railway; making the total receipts on railways in the United Kingdom, for the year 1858, 23,763,765*l.*, on 9568 miles. The expenditure of capital on these railways amounted, in the aggregate, to 315,950,000*l.*, being at the rate of 33,000*l.* per mile.

In noticing the progress of railway traffic for the six years preceding 1858, we find that in 1852 the number of passengers by the parliamentary trains was 23,842,000; while in 1857 it was 45,227,000, or an increase of 89 per cent. The number of passengers in all other classes, in 1852, was 49,392,000, and in 1857, 70,608,000. The number of miles of railway open in 1852 was 5245, and in 1857, 6674. The receipts from 'Parliamentary' passengers in 1852 were 1,346,000*l.*, and in 1857, 2,244,000*l.* The receipts from all other classes were, in 1852, 5,323,000*l.*, and in 1857, 6,753,000*l.* The profits upon the parliamentary trains in 1857, after deducting all expenses, were computed at 1,576,000*l.*; the total expenditure to procure this return being 667,000*l.*; while the profits from all other classes of passenger trains in 1857 were 2,269,000*l.*; the expenditure having been 4,483,000*l.*

The persons employed on the railways of the United Kingdom, in June 30, 1857, according to a parliamentary return of that year, were as follow:—221 secretaries and managers, 26 treasurers, 150 engineers, 398 superintendents, 198 storekeepers, 201 cashiers and accountants, 997 inspectors or timekeepers, 2471 station-masters, 404 ticket collectors, 156 draughtsmen, 8712 clerks, 1335 foremen, 3563 engine drivers, 3644 assistant-drivers or firemen, 3716 guards or breaksmen, 21,337 artificers, 3263 switchmen, 1998 gatekeepers, 2349 police or watchmen, 17,091 porters or messengers, 8260 plate-layers, 26,285 labourers, and 2885 persons in miscellaneous ways. The number of *employés* on the open railroads was 102,107. On 3193 miles of unopened railways there were employed 44,037 persons; so that the railway business of the empire required the services of 153,697 persons of all grades and capacities. Of those employed, 116,634 were in England and Wales, 20,172 in Scotland, and 16,891 in Ireland. But at the present period (1859), the numbers have considerably increased.

Accidents:—During the year 1856, it appears that 281 persons were killed, and 394 injured, on the railroads in the United Empire. Of this number 112 were killed, and 16 injured, who were neither passengers nor servants of the railway companies; 142 killed, and 80 injured, who were servants of companies or *employés* of contractors; and 27 killed, and 298 injured, who were passengers. In the year 1857 the number of accidents amounted to 236 killed, and 738 injured. Of these, 23 passengers were killed and 15 injured from want of caution; while 25 passengers were killed, and 631 injured, from causes beyond their control.

Foreign Railways.—From the 1st of January 1857 to the 30th of December, we find that the traffic returns of the French railways amounted to 11,801,858*l.* on 4481 miles of railway; and for the corresponding period of 1858 to 12,623,741*l.* on 4985 miles; thus showing an increase in the receipts of 821,883*l.*, or about 7 per cent. In Prussia there are five government lines of railway, besides seven under government management, and fourteen belonging to private companies. The length of the whole is about 1376 English miles, and their cost about 36,460,000*l.*

Of the progress and extent of the American railways, the following is a tabular view from their early commencement:—

Years.	Miles.	Years.	Miles.
1828 . .	3	1843 . .	4,174
1829 . .	23	1844 . .	4,311
1830 . .	41	1845 . .	4,511
1831 . .	54	1846 . .	4,870
1832 . .	131	1847 . .	5,336
1833 . .	570	1848 . .	5,682
1834 . .	762	1849 . .	6,350
1835 . .	918	1850 . .	7,355
1836 . .	1,102	1851 . .	9,090
1837 . .	1,412	1852 . .	11,631
1838 . .	1,843	1853 . .	13,379
1839 . .	1,920	1854 . .	16,038
1840 . .	2,167	1855 . .	18,764
1841 . .	3,319	1856 . .	21,069
1842 . .	3,877	1857 . .	24,476

The railways have not only made extensive progress in various parts of Europe, as noticed under the respective countries, but are in the course of rapid formation in our distant colonies and dependencies. [AUSTRALIA, CANADA, HINDUSTAN, &c., *Supplt.*]

RAINFALLS (x. 29–32). The meteorological observations which have been made in this country, as well as in various parts of the world, have been productive of many interesting results. The difference of rainfall at one point, compared with that of another, has been found as much as 127 inches. The causes of this difference have been already explained (x. 31). On the south-eastern side of England, the rainfall, on an average, ranges from 16 to 24 inches; while that on the western side ranges from 30 to 51 inches. The rainfall on the eastern coast of Suffolk is 23·27; while on the western extreme (Penzance), it is 44·70. On comparing places on the *same* degree of latitude, we find that the rainfall at Manchester (lat. 53° 27′) is 36·14; at Nottingham (lat. 52° 57′), 25·08; and at Boston (lat. 53°), 24·90; the rainfall in the Isle of Man (lat. 54° 15′) is 36·25; at Kendal (lat. 54° 21′) is 58 inches, and at Scarboro' (lat. 54° 17′) 22·89. Comparing places on the same

geological formation, the following differences will appear. Take the old red sandstone which is found in South Devon, in Monmouthshire, and Buteshire in Scotland; the rainfall at Dartmoor (Goodamoor) is 57½ inches; at Monmouth, 30 inches; and at Mount Stewart, 46½. On the lias, with its close clay—which crops out in Dorsetshire, and extends to the north of Yorkshire, taking Grantham in its course—the rainfall at Little Bridy is 38·70; at Grantham, 24 inches; and at Scarboro', 22·89.

RAPH'ILITE (Gr. *ῥαφὶς* a needle, and *λίθος* a stone), a light-coloured mineral, so called from the needle-formed crystals of which it is composed. It is of a glassy lustre; its specific gravity, 2·85; and its hardness, 3·75. Its constituents are—silica, lime, alumina, protoxide of iron, and of manganese.

READY-RECKONER, a book of calculations tabularly arranged, which gives the prices of articles or quantities, at one view, and saves the time and trouble of arithmetical or mental processes. As books of immediate reference, they are of great utility in the smaller dealings of trade. Among the different mechanical plans which have been brought into operation, for facilitating the minor calculations of the ordinary business of life, an ingenious apparatus was lately brought out in America, called 'Baranowski's Ready Reckoner.' It was intended for questions in which small sums of money are concerned; such as prices at so much per pound, wages at so much per day, or interest at so much per cent. For the calculation of wages, it has been thus described by the author of 'Curiosities, Novelties,' &c.:—'We see an upright box, with a handle at the bottom, rows of figures up the front, and a number of small slides moved by studs. Near the top, concealed within the box, is a paper on which rates of wages are printed, from 1*s.* to 42*s.* per week; there is a small opening in front of this paper, and by turning the handle any required rate of wages between those limits is brought to the opening. Suppose it to be 24*s.* per week; then "24*s.*" appears at the opening, and the machine is in a condition to show the amount of wages earned in any fractional number of days and hours at that rate. Let it be four days, five hours; we draw aside a little slide at "four days," and another at "five hours;" these reveal openings at which appear printed figures representing the sums of money to which the earnings amount. If the time were four days, five hours and three-quarters, three slides would have to be moved, three sums would appear, and these three would have to be added. Another application of the machine is for calculating goods' tolls at so much per ton. The rate per ton appears at the top, while the tons, cwts., and lbs. appear at the sides, and the result is arrived at on the same principle as in the wages machine.'

REAPING MACHINE, an ingenious contrivance for cutting down corn, &c., without the agency of the sickle or scythe. Many attempts have been made to bring out implements for this purpose; and at the commencement of the present century Parliament voted a reward to the inventor of a reaping machine; but nothing was produced to answer the objects in view. At length, in 1845, an American, by the name of McCormick, brought out a reaping machine, which has since come into very general operation. It has been thus described by the author of 'Novelties, Inventions,' &c.:—'In McCormick's machine there is a cutting blade about an inch in breadth, jagged or toothed in the front edge. It extends across the front of the machine near the ground, and has a reciprocating or oscillatory horizontal motion given to it. Over this blade is a light reel, to which are fixed oblique blades or spars of deal; these spars, when the reel revolves, get behind the stacks of standing corn, and hold them steadily while being cut; the stalks are pressed between projecting tines or fingers, and are then cut by the saw-like action of the blade. When the stalks are thus cut near the ground, they fall on the floor of the machine.'

RECH'ABITES, a religious sect among the ancient Jews, so named from Rechab, the founder, who was the son of Jonadab. Of the exact period of their origin, or when they ceased to exist, historians do not afford us satisfactory information; but we are told that in the last year of the reign of Jehoiakim, King of Judah, when Nebuchadnezzar came to besiege Jerusalem, the Rechabites were compelled to leave the country where they generally resided, isolated from their Hebrew brethren, and obliged to take refuge in the city, for which they had a great abhorrence. Still they did not relinquish their custom of living in tents, or regular encampments.

RECORDS, PUBLIC (x. 94-6). A magnificent structure has been raised, at the back of the Rolls' House in Chancery Lane, which extends its imposing frontage towards Fetter Lane. For the purposes it is intended, it will be one of the most extensive and commodious edifices in Europe. The Master of the Rolls, as already stated (x. 96), is at the head of this important department of the State, and he has the appointment of the Deputy-Keeper. The assistant keepers and other officers, of which the following, with their respective salaries, is a list, are appointed by the Treasury, viz.:—A deputy-keeper, at 1000*l.* per annum; a secretary, from 600*l.* to 700*l.*; six assistant keepers (first class), 400*l.*, rising to 600*l.*; eight assistant keepers (second class), 250*l.*, rising to 400*l.*; twenty-one clerks, at salaries varying from 110*l.* to 200*l.* No scheme of examination has yet been settled. The qualifications required are somewhat peculiar; and it is necessary that any one obtaining an appointment should possess some knowledge of Latin and French, as well as of the ancient styles of caligraphy in which the early records are written.

RECRUITING (x. 97). The recruiting districts of the empire are each placed under the superintendence of an inspecting field-officer, with a competent staff. The following is a list of the districts into which the United Kingdom is divided:—The *London* district comprehends the

counties of Middlesex, Surrey, Bedford, Berks, Bucks, Cambridge, Essex, Herts, Hunts, Northampton, Norfolk, Oxford, Rutland, Suffolk, and Sussex. The *Leeds* district consists of the counties of Cumberland, Durham, parts of Lancaster and York, Northumberland, and Westmoreland. The *Liverpool* district includes the counties of Chester, parts of Derby, Lancaster, Salop, and York, and North Wales. The *Coventry* district, the counties of Derby (part of), Hereford, Leicester, Lincoln, Notts, Salop, Stafford, Warwick, Worcester, and South Wales. The *Bristol* district, Cornwall, Devon, Dorset, Gloucester, Hants (part of), Somerset, and Wilts. In *Scotland* there is but one recruiting district, of which Glasgow is the head-quarters. In *Ireland* there are three districts: the Northern—head-quarters, Newry; the Centre—head-quarters, Dublin; and the Southern—head-quarters, Cork. (*Mil. Encyc.*)

RED SEA (x. 98-100). On the important question of cutting a canal from the Mediterranean to the Red Sea, which has called forth the attention of mankind in all ages, and still continues to occupy it, Baron Humboldt, in his 'Cosmos,' offers the following interesting remarks:—'The history of the contemplation of the universe embraces the enumeration of all the means which have brought nations into closer contact with one another, rendered larger portions of the earth more accessible, and thus extended the sphere of human knowledge. One of the most important of these means was the opening of a road of communication from the Red Sea to the Mediterranean, by means of the Nile. At the point where the scarcely-connected continents present a line of bay-like indentations, the excavation of a canal was begun, if not by Sesostris (Rameses Miamoun), to whom Aristotle and Strabo ascribe the undertaking, at any rate by Neku, although the work was relinquished in consequence of the threatening oracular denunciations directed against it by the priests. Herodotus saw and described a canal completed by Darius Hystaspes, one of the Achæmenidæ, which entered the Nile somewhat above Bubastis. This canal, after having fallen into decay, was restored by Ptolemy Philadelphus in so perfect a manner that, although (notwithstanding the skilful arrangement of sluices) it was not navigable at all seasons of the year, it nevertheless contributed to facilitate Ethiopian, Arabian, and Indian commerce, at the time of the Roman dominion under Marcus Aurelius, or even as late as Septimus Severus, and therefore a century and a half after its construction.'

REDSCHID PASHA, a distinguished statesman, and one of the principal ministers of the Ottoman Porte, was born at Constantinople in 1802. In 1829 he was appointed private secretary to Selim Pasha; and from his zeal and activity in negotiating the treaty of Kutahia in 1833, he was raised to the dignity of Pasha. In 1834 he was engaged on missions to the courts of London and Paris; and the relations which he there formed with the leading diplomatists, statesmen, and political reformers of the time, obtained him great influence in his native country. In 1837 he became Grand Vizier; he did not, however, long hold this appointment, but was sent to Paris by way of exile, and there he eventually succeeded in concluding the Quadruple Alliance, with the view of defending the Ottoman throne against the ambition of Mehemet Ali, of Egypt. On the accession of Abdul-Medjid, in 1839, he returned to Constantinople, and was appointed Foreign Minister. In that capacity, from 1839 to 1857, he largely contributed to those useful reforms which have distinguished the reign of the present Sultan. During the late contest with Russia he undertook the entire direction of the government, which, amidst many difficulties and much opposition, he managed with great ability and prudence. He died in January 1858.

REFORMATORIES, industrial schools established for the purpose of reclaiming juvenile offenders, and educating them at the public expense. An Industrial Schools Act was passed in 1857, which was intended to amend the Youthful Offenders' Act (17 & 18 Vict. c. 86) and the Act on Reformatory and Industrial Schools in Scotland (17 & 18 Vict. c. 74); these Acts having only provided for youthful criminals being sent to the schools established by voluntary contributions. By the present law parents and step-parents, when possessing the ability, can be compelled to contribute to the support of their children in reformatories, and payment can be enforced by distress or commitment to prison. By the same Act it is declared that the school to which youthful offenders are to be committed need not be named in the sentence. Supplemental orders may be made for the removal of youthful offenders from one reformatory to another. They are not to be sent to schools to which the parents or other relatives object; but when sent to other schools the expense of such removal is to be paid by the parties making the objection. Any person wilfully inducing a young person to abscond from a reformatory is to be liable to a penalty of 5*l.*, or to be imprisoned for 60 days. The penalty is to be paid to the treasurer of the institution in which such young person was placed. All reformatories are to be published in the London and Edinburgh *Gazettes*. There are already a good many reformatories certified, and others are being built, over which the National Union presides and renders assistance. At the 'Social Science Congress,' held at Liverpool, in Oct. 1858, the Earl of Carlisle stated the following particulars respecting the progress of these reformatories:—'From the month of January 1856 up to the latest date to which accounts had been made up, the number of the discharged from the intermediate prisons was 1327, of whom 511 were discharged unconditionally, and 816 on tickets of licence. Of the 511 unconditionally discharged, only five had been recommitted to convict prisons. Of the 816 discharged on licence, 45 had their licences revoked, out of whom 15 were so dealt with for keeping bad company, drunkenness, or failing to report themselves; the re-convictions amounted to 30.'

REFUGE, CITIES OF, were very common

among the nations of antiquity, especially the Hebrews, Greeks, and Romans. They were intended for the security of those who were unintentionally guilty of manslaughter. In the Old Testament there are some minute descriptions of them. Moses appointed six cities for the culprit to retire to, and be protected from the fury of the deceased's relatives, until he had time to prepare for his defence. We are informed by Maimonides that not only these six cities were assigned, but also the forty-eight cities which were appointed for the habitation of the priests and Levites; with this difference, that in those established by law the refugee was supported at the public expense. The practice of sanctuary, as it existed among the early Christians, was doubtless borrowed from the above custom. It was so strictly observed under the Eastern emperors, that Gratian, Valentinian, and Theodosius the Great, decreed that those who should go into a church, or other sacred place, and force away any person who had taken sanctuary there, should be condemned to banishment, whipping, &c.; and Honorius commanded that they should be punished as if guilty of treason.

REGA'LIA (x. 103). The regalia, or Crown Jewels of England, exhibited in the Jewel Office at the Tower of London, consist:—1st, of the regal crown used at the coronations of George IV., William IV., and Queen Victoria. It is adorned with a profusion of precious stones and a costly ruby in the centre of the cross, which was originally given by the King of Spain to the Black Prince. The whole is estimated as being worth a million of money.—2nd. The Crown of State, originally made for King Charles II., and worn by the Sovereign when proceeding in state to the House of Lords. The large emerald alone is valued at 100,000*l.*—3rd. The crown worn by the Prince of Wales, on state occasions, when he comes of age.—4th. The sceptre used at the coronation of her present Majesty.—5th. The golden orbs of state, ornamented with precious stones, and used at the ceremony of the coronation.—6th. The Swords of Justice and Mercy. 7th. The royal bracelet.—8th. The golden eagle and spoon.—9th. The wine fountain, salt cellar of state, and the tankard; with a number of other valuable articles, which the public are allowed to inspect, though they are all carefully protected by an iron railing. The whole has been estimated at three millions in value.

REGIMENTAL NECESSARIES, are those articles which are issued to the British soldier for his comfort and cleanliness, such as shirts, stock, boots, razor, &c. In 1829 a circular was issued from the Horse Guards, containing the usual list of necessaries required, with the prices affixed, which serves as a general standard of guidance to this day. The total amount for privates was 2*l.* 13*s.* 1½*d.*; and for sergeants, 2*l.* 15*s.* 7½*d.* Non-commissioned officers are not allowed to sell regimental necessaries to the soldiers. Every article is directed by the regulations to be marked with the owner's name, the letter of his company, and the number of his regiment; and the selling or injury of them renders him liable to be tried by court-martial, and punished. (*Military Encycl.*)

RENDEL, JAMES MEADOWS, F.R.S., the eminent engineer, was born in the neighbourhood of Dartmoor, co. Devon, in 1800. He was brought up as a practical civil engineer; and on his visiting London obtained an engagement under Mr. Telford, who selected him for laying out and constructing some extensive turnpike roads in Devon and Cornwall. He was next employed in the construction of the cast-iron bridge over the river Lary, near Plymouth, which was commenced in 1824, and finished in 1827. He was afterwards engaged in many important works, which required great engineering skill; among others may be mentioned the Montrose Suspension Bridge; the Inverness Bridge; the East and West India and London Docks; the docks at Birkenhead in Cheshire; the Great Grimsby Dock; and the harbours of refuge of Holyhead and Portland; besides numerous other important works, connected with railways, drainages, &c. For sixteen years he was on the Council of the Institution of Civil Engineers; and during the years 1852 and 1853 he held the post of President. He *died* in 1856.

RENFREWSHIRE, SCOTLAND (x. 128–31). According to the census of 1851, the population of the county was 161,091. Of inhabited houses, there were 10,760. The area of the county was 234 square miles, or 150,000 acres, of which about 100,000 are arable. The population of the principal places was as follows:—

Barrhead . .	6,069	Paisley bor.	47,952
Greenock . .	36,689	——— mun.	31,752
Johnstone . .	5,872	Pollockshaws .	6,086
Kilbarchan .	2,467	Port Glasgow .	6,986
Lockwinnock .	2,271	Renfrew . bor.	2,977
Neilston . .	2,075	——— mun.	2,722

REPRODUCTION. [ANIMALS; PLANTS.] For more elaborate accounts of the Reproduction of Animals and Plants, see the 'Cyclopædia of Anatomy and Physiology,' Professor Henfrey on the higher Cryptogamia, Dr. Sanderson's 'Process of Generation,' Schleiden on the Pollen Tubes, Mr. Griffiths' learned paper in the 'Linnæan Transactions,' Valentin on the 'Development of the principal Organs of the Human Embryo,' and other scientific works, which our space does not permit us to enter upon.

REVENUE. The following is a summary of the growth of the revenue since the Revolution of 1688. During the reign of William III. the average revenue was about 4,000,000*l.*; in that of George I. it was 6,000,000*l.*; in the reign of George II., 8,000,000*l.* In the year 1788 it had risen to 15,572,971*l.* In 1820 the sum raised by taxes in the United Kingdom was 65,599,570*l.*; in 1825 it fell to 62,871,300*l.*; in 1830 it was 55,431,317*l.*; in 1835 it was 50,494,732*l.*; in 1845 it was 51,067,856*l.*; in 1850 it was 52,951,748*l.*; in 1855, during the late war, the expenditure was 84,505,788*l.*; in 1856 it was 82,223,400*l.* In 1857 the revenue amounted to 70,390,343*l.*, which was derived from the following sources:—

Customs	£22,464,354
Excise	17,472,000
Property Tax	15,137,996
Stamps	7,269,224
Land and Assessed Taxes	3,104,020
Post Office	2,992,000
Produce of Old Stores	1,122,004
Imprest and other Moneys	407,957
Crown Lands	273,654
Unclaimed Dividends received	87,134
From the East India Company	60,000
	£70,390,343

The principal items of expenditure, in the disposal of this large revenue, were the interest and management of the permanent national debt and terminable annuities, amounting to 27,604,043*l.*; the army and navy, 24,006,557*l.*; miscellaneous civil service, 6,905,456*l.*; salaries of revenue departments, 4,334,288*l.*; redemption of exchequer bills, 2,000,000*l.*; interest on exchequer bills, 988,810*l.*; with several minor charges and contingent expenses.

In 1858 the revenue was 63,120,000*l.* [INCOME TAX; NATIONAL DEBT; TARIFF, &c. *Supplt.*]

RHIZAN'THEÆ, or RHI'ZOGENS (Gr. ῥίζα a root, and ἄνθος a flower), a class of parasitical plants, furnished with cellular scales instead of leaves. Lindley has divided the class into three orders, the *Balanophoraceæ*, the *Cytinaceæ*, and the *Rafflesiaceæ*.

RHIZOBOLA'CEÆ, or RHIZOBOLS, a natural order of plants, of large growth, found in South America. From these are produced the Souari nuts, the kernel of which is remarkably sweet and agreeable; and the timber is used in ship-building. (Lindley.)

RHIZOP'ODA, or RHIZOP'ODES (Gr. ῥίζα a root, and πόδες feet), in zoology, the term applied to a class of aquatic animals, which possess the power of locomotion by means of minute tentacular filaments. They are a class of the lowest division of the animal kingdom,—viz. the Protozoa; and are thus described by Mr. Dallas, when speaking of the *Amœba diffluens*, a creature which presents us with the essential characteristics of the class Rhizopoda in their simplest form:—'In the deposit formed at the bottom of fresh-water ponds, we may often meet with a singular minute gelatinous body, which constantly changes its form even under our eyes, and moves about in its active element by means of finger-like processes, which it appears to have the power of shooting out from any part of its substance. This shapeless gelatinous mass is an animal, the *Amœba diffluens*, well known to microscopic observers under the name of the *Proteus*, from the continual changes of shape which it presents to our notice. It consists entirely of the granular gelatinous matter, and appears to be nearly homogeneous in its texture.' The author then proceeds to describe the animal as possessing neither mouth nor intestinal canal; yet it is of an extremely voracious disposition, seizing upon any minute aquatic animal or plants that may happen to come in its way, and appropriating them to the nutrition of its own gelatinous person. 'The mode in which this apparently helpless creature effects this object is very remarkable. The gelatinous matter of which it is composed is capable of extension in every direction; accordingly, when the *Amœba* meets with anything that it regards as suitable for its support, the substance of the creature, as it were, grows round the object until this is completely inclosed within the body, when it is gradually dissolved. The substances swallowed by this hungry mass of jelly are often so large, that the creature itself only seems to form a sort of gelatinous coat inclosing its prey.'

RHOD'ALITE (Gr. ῥόδον a rose, and λίθος a stone), a mineral of a rose-red colour, discovered in Ireland by Mr. Doran. Its specific gravity is 2·00; its hardness, 2·00; its constituents—silica, alumina, peroxide of iron, lime, and magnesia.

RHO'DIZITE (Gr. ῥοδίζω to give a rosy tinge), a light-coloured translucent mineral found in small crystals on some of the red tourmalines from Siberia.

RHODYMENIA'CEÆ, a natural order of sea-weeds, of a deep-red colour, the species of which are very numerous, and widely dispersed.

RICCIA'CEÆ, a natural order of herbaceous plants, of very diminutive size, which Lindley designates Crystalworts. They are inhabitants of mud or water, and are usually found swimming.

RIFF, a rugged tract of land lying on the northern coast of Morocco, inhabited by savage tribes, who are nominally subject to the Emperor, but live chiefly by piracy, and are the terror of the mercantile interests in that part of the Mediterranean, especially of the Spaniards. The local government, or Caidat, of Riff Proper comprises only the region extending along the shores of Cape Tres-forcas. In the eastern bay, formed by Cape Tres-forcas, lies the Spanish criminal settlement of Melilla. Piracy is systematically established on the other side of Cape Tres-forcas, in the western bay. Its basis of operations is the coast extending along the point of Cape Loued Kiert. The population given to piracy is composed almost exclusively of men of the tribe of Guelaïa of the Berber race. It is supposed that the entire tribe of Guelaïa can number 3250 muskets. Its members inhabit numerous villages, distributed over the plains, which are concealed by rocks or forests. At Djenada, not far from Melilla, the tribes maintain a regular armed post, with a view of intercepting all communication between the Spanish garrison and the interior. Places of refuge exist along the coast, and the pirates' boats, called carrabos, are concealed either in the sand or in grottoes, or under species of huts composed of branches of trees and sand. On the heights that command the spots where the boats are hidden, stand the villages of the Riffs, whence the inhabitants survey the surrounding ocean. When they perceive a mercantile vessel becalmed at some distance from the shore, they hastily arm four or five boats and attack it. They generally discharge their muskets at a distance, in order to frighten the crew, who usually take to their boats and escape. The pirates then take the deserted vessel in tow, bring her to land, and

after having stripped her of every article of value, destroy her by fire. The same fate naturally awaits vessels which are thrown on the coast by tempests. Repeated attempts have been made to destroy this nest of pirates; but they have hitherto proved ineffective. In 1858 a Spanish expedition was sent against them, when the coast was attacked, and all suspected ships destroyed; but this was all that could be effected.

RIFLES. [MINIE RIFLES, MUSKETRY, *Supplt.*]

RINTOUL, ROBERT STEPHEN, the founder and editor of the 'Spectator' newspaper, and one of the most eminent writers of the periodical press, was of Scottish descent, and born in 1787. His first connection with journalism was as editor of the 'Dundee Advertiser,' about 1812, in which he powerfully advocated the liberal politics of the day. In 1825 his connection with this journal ceased. He was soon afterwards engaged on the 'Atlas' weekly newspaper, of London; and in 1828 he succeeded in establishing the 'Spectator' weekly journal, which he continued to edit, on liberal principles, with great tact and ability, to the time of his death, which took place in April 1858.

RITORNEL'LO (Ital. *a returning in music*), a short repetition of the last words of a song, either vocally, or instrumentally. It is sometimes applied to a short introductory symphony, or to that which is introduced between the strains to relieve the voice and improve the general effect. These *ritornelli* were formerly very much in use; and it appears from several passages in the Greek authors that they were introduced as symphonies in the ancient, as well as in modern music.

RIVERS (x. 250-53). Johnston, in his 'Chemistry of the World,' gives the following estimates of the size and aqueous extent of some of the principal rivers in the world. 'The basin of the Thames,' says he, 'covers 5500 square miles; of the Rhine, 89,000; Euphrates and Tigris, 243,000; Brahma Pootra, 270,000; Danube, 312,500; Indus, 410,000; Ganges, 443,000; Volga, 653,000; Nile, 707,000; Yang-tse-kiang, 742,000; Mississippi, 1,101,000; Plata, 1,560,000; and Amazonas, 1,920,000. These and hundreds of minor rivers are unceasingly replenishing the waters of the ocean, and thus pursue that uninterrupted round of interchange which characterizes all creation. In round numbers it may be considered that the ocean surface is equal to 160,000,000 of square miles, and the earth's surface to 40,000,000."

ROBY, JOHN, author of the 'Traditions of Lancashire,' &c., was a banker in Rochdale, co. Lancaster. His first literary production was 'Sir Barham,' a poem in six cantos, which he published in 1815. His 'Traditions of Lancashire' were brought out in 1829; and a second series made its appearance in 1841. In 1835 he made a continental tour, of which he published an account in 1838, under the title of 'Seven Weeks in Belgium, Switzerland, Lombardy, Piedmont, Savoy, &c.' which were illustrated with numerous engravings from the author's own sketches. He was unfortunately drowned in the wreck of the steam-vessel *Orion*, which struck on a rock near Portpatrick, on her voyage from Liverpool to Glasgow, on the 18th of June, 1850.

ROCHESTER (x. 266-7). The great inconvenience of the old bridge over the Medway, arising from the smallness of its arches, and from its being out of a straight line with the principal streets, had long been felt as a public nuisance; and it was at length determined to erect a new one. Accordingly a large and massive iron bridge was commenced in 1850, and finished in 1856. It is a magnificent structure. It is built on granite piers, and the superstructure consists of three expansive cast-iron arches, one of 170, and the other two of 140 feet span. The weight of the bridge is about 2450 tons. The swing bridge, to allow of ships passing, is probably the largest work of the kind. The clear passage for ships is 50 feet, and the bridge spans the whole space, turning on a ring of iron of 30 feet diameter; the width is 40 feet, and the length 109 feet. The total weight is about 300 tons; yet this mass is moved readily by two men. The width of the bridge from parapet to parapet is 40 feet, and the extreme length, including the approaches, 1200 feet.

ROCKING-STONES, huge blocks of stone, existing in different parts of England, Scotland, and Ireland; many of which, like the Loggan rock in Cornwall, can be moved by the slightest pressure of the hand. By geologists they are described as the great boulders of the alluvial period, which have been detached from their primitive rocks; and, after having been rolled about for ages have been deposited on some rocky point, and there left alone when the surrounding soil has been washed away. Some of these stones, however, are supposed to be artificially deposited, and used by the Celtic Druids as objects of divination, the oracular response being determined by the number of oscillations. At Stanton, in Gloucestershire, there is one of these rocking-stones, situated on a promontory, higher than the neighbouring heights, which would seem to confirm the supposition that some of these stones are not in their natural position, but were artificially deposited for religious purposes. Sometimes cavities have been cut in the surface of the rock, for the purpose, it is supposed, of preserving the rain or dew in its natural purity for the religious uses of the Druids; or perhaps, as Borlase says, they were used for libations of wine, blood, oil, or honey. Arthur's Troughs, in Cornwall, are illustrative examples. These stones have received the appellation of *Rock-basins.*

ROGERS, SAMUEL, F.R.S., F.S.A., author of 'The Pleasures of Memory,' was born at Stoke Newington, in Middlesex, in 1763. His father was a banker in London, to which firm his son eventually succeeded as a partner. He was educated at the school of the Rev. Mr. Pichbourne of Newington Green. Early in life he began to study the world of art in foreign travel. He first made his appearance as a poet in 1786, when he brought out 'An Ode to Superstition, and other Poems.' In 1792 he produced a poem, written in English heroics, entitled 'The Pleasures of Memory.' It was replete with elegance of diction and purity of

thought, and still ranks among the classics of English literature. This production was the means of introducing him to Mr. Fox, with whose political sentiments the poet was ever afterwards deeply imbued. The next work was his 'Epistle to a Friend,' published in 1798, the design of which was to illustrate the virtue of true taste. The execution was in the manner of Parnell or Goldsmith. About this time he obtained the friendship of Lord Byron, who, in his satire of 1809, designates our poet as the 'melodious Rogers.' Byron's first introduction to Tom Moore and Tom Campbell was at the dinner-table of Rogers. In 1812 appeared his poem of 'Columbus,' but it appears to have disappointed public expectation. This was succeeded, in 1814, by 'Jacqueline,' a tale; and in 1819 he brought out a poem, entitled 'Human Life,' but it was never very popular. His last work was his descriptive poem of 'Italy,' of which he had given a foretaste in some poetical lines on Pæstum, which were written in 1815, during his sojourn in the Italian peninsula. Though his literary labours may be considered to have ceased with the production of this work, he did not entirely desert the Muse, but occasionally indulged in short effusions, such as those graceful verses addressed to Lord Grenville and to Earl Grey. He devoted the remainder of his literary life chiefly to the publication of those two beautifully-illustrated volumes, his 'Italy,' and his 'Poems,' on which he spent many thousand pounds. He died in 1855.

Unlike the needy poets, who have too often crowded the ranks of literature, Rogers, for more than half a century, figured in the foremost ranks of London literary society. It is indeed doubtful whether any poet ever lived so much in the smiles of the world as the banker-bard of the West End. He had pronounced himself a liberal, and with nearly all the liberals of wit and genius he was in intimate alliance. The hospitalities of his splendid mansion of St. James's Place were ever open for their reception and entertainment.

ROMAN CATHOLICS. The position of the Roman Catholic Church of Great Britain, according to the official journal of Rome, lately published under the sanction of the Vatican, is as follows:—In England there are 730 churches and chapels, and in Scotland 164; of bishops and priests, 1162; of religious communities for males, 23; and for females, in England and Scotland, 106. The Catholic hierarchy of the empire is set down at 1 archbishop, and 12 bishops for England, 4 archbishops, and 26 bishops for Ireland; 6 archbishops and 46 bishops for the colonies. Eleven Catholic colleges, besides forty schools for young ladies, are stated to be conducted by nuns. There are also Catholic colleges for England and Scotland on the Continent—the English College at Rome, founded by Gregory XIII. in 1572, that founded by Pius IX. in 1852, and the Scotch College; the English and Scotch College at Valladolid, the English College established at Lisbon in 1624, the Scotch College at Ratisbon, and the English College established at Douay in 1611. All Saints' College and the Catholic University at Dublin are described, as well as the correctional schools at Hammersmith and Mount St. Bernard in Leicestershire, concluding with the various Catholic charitable establishments in the country.

ROME. According to the official census of 1857, there were, in the fifty-four parishes, 180,359 inhabitants; the population of the preceding year being 179,952. Under the title Heretics, there were enumerated 854 Jews and Turks. In the general population were included 34 bishops, 1331 priests, and 2424 monks and regular ecclesiastics.

Within the last few years some important events have transpired. On the accession of Pope Pius IX., in 1846, the most favourable expectations were entertained, on account of the extreme liberality of his measures. Among other acts he published a general amnesty in favour of all political offenders, by which 2000 persons were set at liberty. He also introduced many useful reforms; which excited the hatred of the priesthood, and the jealousy of Austria. But on the breaking out of the French Revolution, in 1848, the pope began to waver, as if alarmed at the democratic spirit he had evoked. The people rose in rebellion, because his Holiness refused to declare war against Austria in her struggles with the Lombardians. He was obliged to make his escape in disguise, and arrived as a fugitive at Gaeta, on the night of the 25th of December, 1848. A provisional government was established at Rome, which immediately deposed the pope from all temporal power, and declared the form of government to be that of a pure democracy. In the meantime the government of France, apprehensive of the active interference of Austria, Naples, and Spain, came to the determination of sending a French expeditionary army against Rome. Some severe contests took place, in which the Romans, under Garibaldi, were at first victorious; but at length they were obliged to succumb to overwhelming numbers. The Roman government was then overturned, and the papal despotism eventually restored. Under the protection of French bayonets, the ecclesiastical courts were re-established; and all the laws of the previous government entirely abolished. The French troops still retain possession of Rome; and all the old hierarchal tyranny continues to reign supreme.

ROSCOMMON, County of, in Ireland (x. 341–4). According to the census of 1851, the population of the county was 174,492; with an area of 607,691, or 969 square miles, of which 440,522 acres are arable, and 130,300 uncultivated. The population of the principal places was as follows:—

Boyle . . .	2727	Roscommon . .	3086
Castlereagh . .	2613	Strokestown .	1916
Elphin . . .	4727		

ROSS, ADMIRAL SIR JOHN, the distinguished Arctic navigator, was born at Balsarroch, Wigtownshire, Scotland, in 1777. He entered the navy in 1786, received his commission as lieutenant in 1805; and attained the rank of commander in 1812; during which period he distinguished himself by many valuable services. In 1808 a pension was granted him, in consideration of the wounds he received, when cutting out a Spanish vessel from under the batteries of Bilboa.

In 1818 he received a commission, as commander of the *Isabella* (in company with Lieutenant Parry of the *Alexander*), 'to ascertain the existence or non-existence of a North-west passage in the Arctic regions.' He undertook the voyage, and penetrated as far as Lancaster Sound. After making some useful explorations he returned, but without having succeeded in the main object of his expedition. In the following year Lieutenant Parry was commissioned to explore the Arctic Seas, and succeeded in passing through Lancaster Sound into Barrow's Strait, and discovering Prince Regent's Inlet. [PARRY, ADM., *Supplt.*]

In 1829 Ross, who had been advanced to the rank of post-captain, undertook a second voyage, in search of the North-west passage, equipped at the expense of Sir Felix Booth, sheriff of London. The vessel was named the *Victory*; and it was attended by a smaller one of 16 tons burden, supplied by the government. He succeeded in entering Prince Regent's Inlet; but in October the vessels were frozen up in Felix Harbour, on the west side of the Gulf of Boothia. The expedition was equally unfortunate during the two succeeding winters; and in May 1832 the vessels were abandoned. In August 1833 the ice fortunately broke, and the crew were enabled to set sail in boats. When near the entrance of Lancaster Sound, they descried the whale ship *Isabella*, the identical vessel that Captain Ross had commanded in his previous voyage; and in this vessel they reached Hull, on the 19th of September, 1833. In 1834 he received the honour of knighthood. In 1835 Sir John Ross published an interesting narrative of his voyage, and of his long residence in the Arctic regions; with some notices of his discovery of the Northern Magnetic Pole. In 1839 he was appointed consul at Stockholm, which post he held for about six years. In 1850 he went out in search of Sir John Franklin (the enterprising Arctic navigator), in a small vessel of 90 tons; but he was unsuccessful in his object. In 1851 he attained the rank of rear-admiral.

Independently of the interesting narrative of his second Arctic voyage, Sir John Ross was the author of several smaller works; among others may be noticed his 'Memoirs and Correspondence of Admiral Lord de Saumarez:' 'Letters to Sea-officers:' a 'Treatise on Navigation by Steam,' &c. He died in London in 1856.

ROSS AND CROMARTY SHIRES, Scotland (x. 350–54). According to the census of 1851, the population of the county was 82,707; inhabited houses, 15,941; with an area of 3151 square miles, or 2,016,375 acres, and the population of the principal places was as follows:—

Cromarty . .	1988	Stornoway .	pa. 8057
Dingwall . .	1990	——— .	t. 2391
Fortrose . . .	1148	Tain . . .	2588

ROTHSCHILDS, a Hebrew family who have distinguished themselves for their vast wealth and great financial transactions throughout all Europe. The founder of this family was MAYER ANSELM, who was born at Frankfort, and died in 1802, leaving to his five sons an immense fortune and unbounded credit; and they, by combining their operations, and always acting in concert, consolidated a power whose influence was able to regulate the financial operations of the mightiest empires, and sway the counsels of all the courts in Europe. The names and residences of these five sons were, ANSELM, of Frankfort; SOLOMON, of Vienna and Berlin; NATHAN MAYER, of London; CHARLES, of Naples; and JAMES, of Paris. NATHAN Rothschild died in 1836; Solomon, in 1854; and Baron ANSELM in 1855.

The earliest employment in which NATHAN Rothschild was engaged, was as agent for his father, about 1800, in the purchase of Manchester goods for the Continent. Shortly afterwards, through the agency of his father, he had large sums placed at his disposal for the elector of Hesse Cassel and other German princes, which he employed to so much advantage, in loans and otherwise, that he soon realized a princely fortune, and established the financial reputation of the family throughout Europe.—BARON ANSELM, who died in 1855, though possessed of less education than his brothers, was a first-rate genius in everything appertaining to matters of finance. He died childless, and left a fortune of nearly five millions sterling. A portion of his vast property was liberally distributed in charitable objects. To the Jewish school he left 50,000 florins; to the fund for giving a dower to Jewish maidens, 50,000 florins; to supply the alms which he had been accustomed to distribute, 1,200,000 florins, &c.

ROUBLE, the name of a Russian coin of different values, struck in silver, gold, and platina. The silver coin of 100 copecks is the legal standard of silver currency, by which accounts are kept, and is worth from about 3*s.* 1½*d.* to 3*s.* 7*d.* The gold rouble contains 27 parts of pure gold in coined pieces of 10, 5, 3, and 1 rouble each; 100 roubles of gold being equal to 103 roubles of silver, according to enactment. The coined pieces of platina are of 12, 6, and 3 roubles each, and of the same value as the silver roubles.

ROUNDELAY (Fr. *rondelet* a little poem), the name of a simple rural strain, both short and lively, frequently used by our old English poets. According to the French writer Menage, it was so denominated from its peculiar construction, by which the poem or song constantly returned to the first verse, and thus, as it were, went *round*. The common roundelay consisted of thirteen verses, eight in one rhyme, and five in another; and one of its principal rules was, that the first verse should have a complete sense, and yet join harmoniously and pleasantly with the other verses.

ROXBURGHSHIRE, Scotland (x. 376-9). According to the census of 1851, the population of the county was 51,642. Of inhabited houses there were 7255; area 720 square miles, or 460,938 acres, of which 200,000 are arable. The population of the principal places was as follows:—

Castletown . .	2130	Kelso . . .	4783
Hawick . . .	6683	Melrose . .	pa. 7365
Jedburgh . bor.	3615	——— . .	t. 966

ROYLE, DR. J. FORBES, F.R.S., F.L.S., &c., an eminent botanist, and lecturer on Materia

Medica at King's College, London, was originally a pupil of the late Dr. Todd Johnson. Early in life he entered the service of the East India Company, and was for some time the superintendent of the Company's botanic garden at Saharunpoor. On his return to England he published the result of his researches in the Himalayas, in a work of some importance, entitled 'Illustrations of the Botany and other Branches of the Natural History of the Himalaya Mountains.' While lecturer at King's College, London, he brought out his 'Manual of Materia Medica,' which still continues to form one of the text-books in our Medical schools. In 1840 he published an 'Essay on the Productive Resources of India;' and in 1855 appeared his work on the 'Fibrous Plants of India,' which pointed out those plants that might be most available for British manufactures. He died in January 1858, at Heathfield Lodge, Middlesex.

RUBINI, GIAMBATTISTA, celebrated as a musician and tenor singer, was born at Romano, in the province of Bergamo, in 1795. He received his first instructions from his father, who was a professional musician and teacher of music. Young Rubini was first engaged at Naples in 1815, and afterwards at Paris in 1825. He was there triumphantly successful in the Donna del Lago, Gazza Ladra, and Otello; and was soon acknowledged as the 'King of Tenors,' not only in Paris, but at London, Petersburgh, and other cities of Europe. His brightest years were divided between Paris and London; and he formed one of that distinguished quartette Grisi, Lablache, and Tamburini. His receipts, during the latter period of his life, were not less than 8000*l.* per annum; and he left behind him a fortune of 90,000*l.* He died in 1854.

RUPEE, the principal coin in circulation throughout our Indian territories. There were formerly two kinds of rupees, the sicca rupee and the East India Company's rupee; 100 of the former being equal to 116 of the latter. The East India Company's rupee, which was introduced in 1835 in place of all others previously current, is worth intrinsically 1*s.* 11*d.*; but it is usually converted into sterling at the rate of 2*s.*

RUSSELL, RIGHT REV. DR., Bishop of Glasgow and Galloway, was born in Edinburgh, in 1781. He was educated at the college of Glasgow, where he took the degree of A.M. in 1806. In 1820 he received the degree of LL.D. from the University of Glasgow; and in 1837 was elected Bishop of Glasgow and Galloway, on that diocese being separated from Edinburgh and St. Andrews. But Bishop Russell is chiefly known for his useful literary productions. One of his earliest publications was 'On the System of Education pursued in the Schools and Universities of Scotland,' which appeared in 1813. For Rivington's Theological Library he wrote the 'History of the Church in Scotland;' and he was, for many years, an able contributor to the 'Encyclopædia Metropolitana,' as well as to the 'British Critic.' But the work which has acquired him the most extended reputation, both in England and on the Continent, was the 'Connection of Sacred and Profane History,' which made its appearance in 1827 and 1837. So highly were his talents estimated, that the university of Oxford conferred upon him the degree of D.C.L. by diploma—an honour which had never before been conferred on any Scotchman not educated at Oxford. During the period of his episcopate, he devoted his whole energies to promoting the interest of his diocese; and with so much success, that in eleven years he doubled its number of churches. He died at Edinburgh in 1848.

RUSSIA (x. 409–26). Since the accession of the Emperor Nicholas to the Muscovite throne, in 1825, the restless spirit of aggression has ever been manifesting itself, and some important events have lately transpired. [NICHOLAS I., *Suppl.*] So early as 1833, the newly-acquired ascendancy of Russia in the Turkish divan began to excite the jealousy of England and France. The Sultan having applied to Russia for aid, to check the advance of the victorious armies of the Pasha of Egypt, she immediately sent an auxiliary force. England was not inactive. Terms were soon imposed on Mehemet Ali. But Russia did not fail to exact her own conditions; and she compelled the Sultan to sign the treaty of Unkiar-Sklessi, by which the Porte engaged to have recourse to no other power for assistance, and to close the Dardanelles against all foreign ships of war. In 1841 the treaty respecting the closing of the Dardanelles was confirmed, at the solicitation of the Sultan, by the united powers of Great Britain, France, Russia, Prussia, Austria, and Turkey. In 1849, by the treaty of Balta-Liman, Russia was recognised as a protecting power of the principalities of Moldavia and Wallachia. These concessions on the part of the Sultan made Russia the almost absolute mistress of the destinies of Turkey, as well as of Persia,—her immense territories extending latitudinally from the Arctic ocean on the north, to the distant shores of the Caspian on the south; and longitudinally from the Baltic to the Northern Pacific, being an extent of above 4000 miles. Thus we shall find, on examining the boundaries of Russia, as they existed in the time of Peter the Great, and comparing them with a modern chart, that she has advanced her frontier *500* miles towards Constantinople, 630 miles towards Stockholm, 700 miles towards Berlin and Vienna, and 1000 miles towards Teheran, Caboul, and Calcutta. Her population, at the same time, has been wonderfully progressive. At the period of Peter the Great, it was 15,000,000; at the accession of Catherine the Second, in 1762, it was 25,000,000; at the accession of Paul, in 1796, it was 36,000,000; at the accession of Nicholas, in 1825, it was 58,000,000; and now it is about 70,000,000; with an active army of 637,000 men, and a reserve of 253,000. Yet with all these acquisitions the Czar, for some years past, has been directing his attention to the north-eastern boundaries of China, and has at length succeeded in securing a vast extent of territory north of the river Amoor, in the sea of Okotsk, North Pacific. This river, which now forms the south-eastern boundary of the Russian empire, is one of the most magnificent rivers of the old world, having a navigable course of 2240

miles. In 1685, 1692, and 1719, the Czars of Russia sent embassies to China for leave to form a settlement there, but without success. In 1852, however, the Emperor of China granted a treaty, allowing the Russians the navigation of the Amoor. But this permission, in less than twelve months, was converted into absolute possession of the whole course of the river, together with an enormous tract of country of above 1000 miles in length, and in some parts as much as 500 miles in breadth. In addition to this extent of territory Russia acquired the exclusive ownership of the Yablounoi Mountains, said to surpass in mineral wealth anything that has yet been discovered in California or Australia. To turn this invasion to advantage neither money nor labour has been spared. Since 1852 steamers have been put upon the river, the coasts opposite its mouth have been lined with a chain of posts, and the harbour has been fortified in a manner which, when finished, it is said, will equal Cronstadt or Sebastopol in strength.

Yet the spirit of Russian aggrandisement appears insatiable. Turkey is the prize at which she has long aimed; and in 1853 she sought a cause of quarrel. The Russian troops took forcible possession of the Danubian provinces, under the pretence of obtaining guarantees for the protection of Turkish subjects professing the Greek religion, of which the Czar assumed to be the head. After protracted negotiations with the courts of England, France, Austria, and Prussia, the two former powers were compelled to send their fleets to the Black Sea and the Baltic to arrest the insidious pretensions and violent aggressions of Russia. The Czar immediately issued an angry manifesto to the Russian nation, declaring that 'the English and French Governments had sided with Turkey, and, without previously declaring war, had sent their fleets into the Black Sea, proclaiming their intention to protect the Turks, and to impede the free navigation of their vessels of war.' England and France soon afterwards issued a declaration of war, as the only effectual means of arresting the aggressive career of the Russian Autocrat. A sanguinary contest was the result, and the South of the Crimea was the scene of the great battle-field. But the repeated defeats of the Russian armies, the destruction of their fleet, and the capture of Sebastopol, eventually led to the treaty of Paris, March 1856, by which the allied troops were withdrawn from the Crimea, and Russia compelled to evacuate the Danubian Provinces. [CRIMEA; SEBASTOPOL; TURKEY, *Supplt.*]

According to the official documents which have been published, the total loss of the Russians by death or disease, from the period of their passing the Pruth, in 1853, to the signing of the treaty of Paris, was 277,000 men. The losses of the fleet were estimated at 23,000 men out of the 38,000, of which the effective force of the Russian Black Sea fleet consisted.

On the death of the Emperor Nicholas, which took place in March 1855, his eldest son succeeded to the throne, by the title of Alexander II. Since his accession, and especially after the termination of the late war, the new Emperor has devoted his serious attention to the emancipation of the Russian serfs, to which a vast body of the nobility are strongly averse. A report was lately presented to the new Czar, at his express desire, which contained statistical returns of the landed property and number of serfs in Russia; from this it appeared that the families who are landowners amount to 127,000. Out of these, 2000 possess from 1000 to 10,000 serfs; 2000 from 500 to 1000; 18,000 from 100 to 500; 30,000 from 21 to 100; and 75,000 have less than 21. The total number of peasant serfs of the nobility amounts to 11,760,000, and those of the Crown to 9,000,000. Thus there are 20,760.000 persons anxiously waiting for their emancipation.

According to the census of 1852, the population of the Russian empire, as it appears on Baron de Haxthausen's authority, was as follows:—

Divisions.	Pop. 1852.	Sq. Miles.
Great Russia . . .	20,403,371	328,781
Little Russia . . .	11,775,865	150,141
New Russia	3,259,612	96,636
White Russia . . .	2,937,436	70,399
Western Provinces .	2,870,667	47,076
Baltic Provinces . .	1,761,907	36,616
Northern Provinces .	1,420,629	536,226
Ural Provinces. . .	10,770,181	447,788
Cossack Districts . .	1,156,736	123,776
Poland	5,156,543	49,230
Finland	1,499,199	135,808
Total in Europe . .	63,012,146	2,022,477
Total out of Europe	6,648,000	5,261,075
	69,660,146	7,283,552

The different races of the Russian empire (Sclavonic, German, &c.) have been thus enumerated:—Russians, 49,000,000; Poles, 6,500,000; Lithuanians and Lettes, 2,000,000; Bulgarians and Illyrians, 500,000; Germans, 650,000; Dacian Romans, 750,000; Tschudes, 3,400,000; Tartars, 2,150,000; Mongols, 250,000; Munchus, 100,000; Hyperboreans, 200,000; Caucasian tribes, 2,750,000; Greeks, 70,000; Jews, 1,600,000; Gipsies, 30,800; miscellaneous, 50,000. The territories out of Europe embrace the extensive regions of Western and Eastern Siberia, containing 4,803,147 square miles, besides the territories of the Caucasus and of American Russia.

RUSSIA COMPANY, a commercial body established by royal patent in the reign of Philip and Mary, and permanently incorporated, by an act of Elizabeth, under the above title. In 1699 another Act was passed, still further extending the privileges and trade of the company to Russia. The dues received in London, on the importation of goods from Russia, are little more than nominal. By far the greater amount is paid by members of the Court of Assistants. Her Majesty's consul at St. Petersburgh is the commercial agent of the company. (Simmonds' *Dict. of Trade Products.*)

RUSTSCHUK, a town of Bulgaria, situated at the confluence of the Cara Lom with the Danube. It is 40 miles from Nicopoli, and about the same distance from Bukharest. It has a castle of considerable strength, with several mosques, baths, and public buildings. The inhabitants, consisting of Turks, Armenians, Greeks, and Jews, amount to about 24,000, who are chiefly employed in the manufacture of cotton, silk, linen, woollen, &c. The place has been the scene of some sanguinary conflicts between the Turks and the Russians, especially in 1811 and 1828.

RUTLANDSHIRE (x. 429-31). According to the census of 1851, the population of the county was 22,983; of which 11,801 were males, and 11,182 females. Of houses, inhabited and uninhabited, there were 4741. The area of the county was estimated at 95,805 acres, or 150 square miles, with 154 persons to each square mile. The population of the principal places was as follows:—

Ketton . . .	1138	Ryall	1075
Oakham . . .	2800	Uppingham . .	2068

S.

SABLE (Russ. *sabol*, and Swed. *sabbol*), in zoology, the *Mustella zibellina* of Linnæus, or Sable-weasel; a species of *Viveridæ*, which supplies a beautiful and very valuable fur. It is an inhabitant of the north of Europe; but the fur from the Russian marten is too costly for ordinary use. The American sable has a fur which varies in colour from black to tawny; but it is sometimes coloured to imitate Russian. The hair of this animal's tail is commonly used for the brushes or pencils of artists.

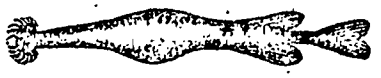
SAC'CHARITE (Lat. *saccharum* sugar), a mineral of a light-green colour occurring in Silesia, and having some resemblance to felspar.

SACRAMENTO, a city of the State of California, belonging to the United States. This place owes its origin to the gold-diggings, which were first discovered at Sutter's Mill, on the American Fork, about fifty miles east of this city. [CALIFORNIA, *Supplt.*] It is situated about 150 miles from San Francisco, lat. 38° 34′ N.; and such has been its prosperity within the ten years of its existence, that it now contains the state-house, court-house, churches for almost every denomination of Christians, banking-houses, a theatre, iron foundries, manufactories, and printing-offices, which issue several daily and weekly newspapers. In 1854 the population was 12,000, and it has since been yearly increasing.

SAFETY-LAMPS (vii. 809). The safety-lamp, invented and brought into use by Sir Humphry Davy, has already been described. Since his time various improvements have been devised, and carried into operation. Among others may be mentioned that of M. Mueseler, a mining engineer of Belgium. In this lamp a part of the metallic covering which surrounds the flame, and forms the chimney, is replaced by a glass, which is calculated to give a much stronger light than that given by the Davy-lamp. The mode also by which the air, for the support of combustion, is introduced, is a great improvement. It is received from above through two wire gauges at right angles to each other, and then effects its escape by a central chimney. Many thousands of these lamps are said to be in use. Another engineer of the same country, by the name of Eloin, has also brought into use a safety-lamp with a glass in its lower part, which is concave on the outside, for the purpose of dispersing the rays of light. But a safety-lamp, which appears admirably adapted for the purposes required, has been lately patented by Messrs. Wilkins and Co., light-house engineers to the Trinity House. In this lamp the flame is surrounded completely with glass or talc. The gauze, which in the Davy-lamp is continued from the level of the wick upwards, commences here about three inches higher, by which plan the light is less obscured. The draught or circulation is maintained by the external air passing through the body of the oil-can by means of four large tubes around the wick, communicating with a lower chamber in connection with the external air through the meshes of a fine metal gauze, the advantage of which is the steadiness with which the light burns in the greatest draught. Two kinds of lamps are now being manufactured; one intended to be used in situations where the existence of explosive gases may be remedied as soon as discovered, as in sewers, gas-works, &c.; and the other in mines and situations where workmen are obliged to work continually in a highly-explosive atmosphere.

SAGIT'TIDÆ (Lat. *sagitta* an arrow), a small family of Mollusca, belonging to the sub-class *Heteropoda*, the type of which is the *Sagitta*, a curious arrow-shaped mollusc, principally found in the Mediterranean and the North Sea. These Sagittæ are little fish-looking creatures, so called from their arrow-like forms. Their bodies have an undulating appearance, thick in the centre, and furnished with fin-shaped organs, and a broad double lobed caudal fin. They are small in size, but swim with great rapidity. The head is distinct; and the mouth is armed laterally with

several pairs of hook-like jaws; of which the annexed is a representation.



THE SAGITTA.

SAILINGS (x. 466–7). On the subject of *Circle Sailing*, which has been already explained, we have been furnished with some useful statistics by Lieutenant Maury, of the United States Navy, who gives the correct distances (in geographical miles) of the various routes across the Atlantic as follows:—

	Miles.
Philadelphia to Liverpool . .	3090
New York to Southampton . .	2980
New York to Liverpool . . .	2880
New York to Glasgow . . .	2800
Boston to Liverpool . . .	2720
Boston to Belfast	2620
Boston to Galway	2520
Newfoundland to Galway . .	1730
From Boston to Liverpool is shorter than from—	
Philadelphia to Liverpool, by . .	370
New York to Southampton, by .	266
New York to Liverpool, by . .	160
New York to Glasgow, by . .	180
From Boston to Galway is shorter than from—	
Philadelphia to Liverpool, by . .	570
New York to Liverpool, by . .	460
New York to Glasgow, by . .	280
From Boston to Galway is shorter than from—	
Boston to Liverpool, by . . .	200
Boston to Belfast, by . . .	100

SAINT ARNAUD, MARSHAL. [ARNAUD, *Supplt.*]

ST. PAUL'S. [CATHEDRALS, *Supplt.*]

ST. PETER'S. [CATHEDRALS, *Supplt.*]

SALII, among the Romans, were the priests of Mars, twelve in number, whom Numa himself appointed out of the patricians, as a kind of dancers, and singers of hymns in praise of the god of war. Their duty was to protect the sacred shields called Ancilia, one of which Numa pretended was sent down from heaven as a pledge of celestial protection.

SALOP, County of. [SHROPSHIRE, x. 980, and *Supplt.*]

SALT (Germ., Span., Ital., Fr., &c., from the Lat. *sal*). In nearly all European languages, Salt is a word of general application to the most useful condiment in nature; which, as a seasoner and preserver of food, has been known and appreciated from the earliest ages. 'To have eaten a man's salt' is the oriental phrase for receiving all the rites of hospitality. Common salt is composed of chlorine and sodium, and is known, in chemical language, as chloride of sodium; or, what may be considered as the same thing, muriatic acid and soda (muriate of soda), which two constituents combine with great force, and are difficult to separate. Salt is very soluble in water; and, when applied to animal or vegetable substances, as is well known, has the power of arresting, for some time, their fermentation, putrefaction, or decay. It occurs extensively in a fossil state; and in that form is called *rock salt*; or is otherwise obtained by evaporation from the saline waters of the ocean. [SALT TRADE, x. 502.]

In Silliman's 'Journal of Science' there appear some elaborate calculations of the quantity of common salt in the different oceans of the globe. The entire amount is there estimated, by Schaffhault, at 3,051,342 geographical miles, or about five times more than the mass of the Alps. The sulphate of soda (says Schaffhault) equals 633,644 cubic miles; the chloride of magnesium 441,811 cubic miles; and the fine salts, 109,339. If we admit, with La Place, that the mean depth of the ocean is from four to five miles, the mass of marine salt would be more than double that of the great Himalaya range of mountains. Of the proportion of saline matters in the ocean, and the specific gravity of the water, the gravity varying according to the proportion of the saline ingredients, the late Dr. Marcet has given a series of interesting experiments; and the following are the general conclusions which he thence deduces:—1st, That the southern ocean contains more salt than the northern, in the ratio of 1·02919 to 1·02757;—2nd, That the mean specific gravity of sea-water near the equator is 1·02777; or intermediate between that of the northern and that of the southern hemispheres;—3rd, That there is no remarkable difference in sea-water under different meridians;—4th, That there is no satisfactory evidence that the sea, at great depths, is more salt than at the surface;—5th, That the sea in general contains more salt where it is deepest, and most remote from land; and that its saltness is always diminished in the vicinity of large masses of ice;—6th, That small inland seas, though communicating with the ocean, are much less salt than the ocean;—7th, That the Mediterranean contains rather larger proportions of salt *than* the ocean.

Dr. Prout, in his 'Bridgwater Treatise,' further explains the subject, when he states that 'the saltness of the sea is considerably influenced, at least at its surface, by the neighbourhood of large rivers, and by permanent accumulations of ice. On the other hand the superior saltness of the Mediterranean has been ascribed to the immense evaporation from its surface.' It is curious to see how the French chemist, M. Balard, undertakes to doctor the water of the Mediterranean. He first concentrates it by evaporation, where common salt is deposited. From the remaining liquor he produces sulphate of magnesia; and by a third process obtains the double chloride of potassium and magnesium; from which other valuable salts and acids are produced.

The manufacture of salt is carried on to a vast extent in eleven of the United States of America; the great sources of supply being salt brine obtained from deep wells far removed from the ocean. The annual salt product amounts to 12,370,000 bushels. The State of New York produces the most, her supply being 6,000,000 bushels; and Virginia is the next, her product being 3,500,000.

(*Phil. Trans.*; Schaffhault; Dr. Prout.)

SALTATO'RIA (Lat. *salto* to leap), a family of Orthopterous insects, composed of the genus

Gryllus, which comprehends the crickets, grasshoppers, &c. The entire family is remarkable for their spinous tibiæ and the largeness of their thighs, which are well adapted for leaping.

SAMANÆ'ANS (Hindust. *schamman* a philosopher), a sect of Indian philosophers, entirely distinct from the Brahmins. They believe in one God, who, they suppose, pays no attention to human affairs, but leaves the government of the world to inferior agents, to whom they address their devotions.

SAN BUONAVENTURA. [CALIFORNIA, *Supplt.*]

SAN DIEGO. [CALIFORNIA, *Supplt.*]

SAN FRANCISCO, Upper California (x. 516, and *Supplt.*). This place, having become the great entrepôt of the vast imports from America, Europe, and Asia, in exchange for her golden ore, is becoming one of our greatest commercial marts. After the discovery of the auriferous deposits, and the extraordinary earnings made by those employed in the 'diggings,' the prices of labour, houses, and all sorts of provisions rose to an enormous height; and large sums were made by those who carried supplies to San Francisco. The prices for labour were enormous. Servants were paid at the rate of 100 to 200 dollars per month. A common carman received a salary of 6000 dollars a year, and many others made from 15 to 20 dollars daily. An ordinary rifle was sold for 100 dollars; a pair of small belt pistols from 32 to 48: clasp, sheath, and bowie knives for as much as four guineas each; powder for four or five shillings an ounce; percussion caps nearly ten shillings a hundred: and cigars more cheaply at four and sixpence a dozen. Property and rents of houses rose to an enormous and unnatural value. A building called the 'Miners' Bank,' about half the size of a common domicile in England, was held at a rent of 75,000 dollars; the Post-office at 70,000 dollars; a mere shed, 15 by 20 feet, called 'El Dorado,' and occupied by gamblers, was rented at 40,000 dollars; and so on in proportion. But the large importations of all kinds of manufactured articles, from every part of the world, have since reduced the various articles of life almost to their natural level; and the recent discoveries of gold on the banks of the Fraser River, in the Oregon territory, is rapidly draining the population; so that San Francisco, notwithstanding its importance as a great commercial depôt, is gradually settling down to the quietness of an ordinary but busy sea-port.

SAN GABRIEL. [CALIFORNIA, *Supplt.*]

SAN JOACHIM. [CALIFORNIA, *Supplt.*]

SAN JOSÉ. [CALIFORNIA, *Supplt.*]

SAN SALVADOR. [SALVADOR, SAN, x. 503–5.]

SANA, a city of Arabia, capital of the province of Yemen, and residence of the Imam; about 128 miles N.N.E. of Mocha.—Sana is also the capital of a province of the same name in Peru, on the coast of the Pacific Ocean, 80 miles N. of Truxillo.

SAND (x. 522). The sands of the African wilds present some remarkable phenomena, which, happily, are never witnessed or experienced in our northern climates. The particles are so remarkably fine that they sometimes form on the ground waves that resemble those of the sea, which, it has been related, have been known to overwhelm caravans in passing over the desert, or even to swallow up entire armies. The immensity, the swiftness, and the perpetual motion of these waves affect the sight of men and beasts; so that they are frequently marching as if in the dark; and it is thus that the results are sometimes fatal. At times these waves of sand form vast hillocks, of from twenty to thirty feet high, which are often transported from one place to another. Dr. Clarke, in his travels in Egypt, mentions immense pillars of sand, which advanced rapidly towards him, turning upon their bases as upon a pivot; thus fully verifying the accounts that Bruce gives respecting these pillars of sand, which he witnessed in Nubia, near Chendi—a large village on the banks of the Nile. Bruce represents these pillars as one of the most magnificent spectacles imaginable, at which he and his companions were amazed, and at the same time impressed with feelings of terror. Having reached the vast expanse of the desert which lies to the west and north-west of Chendi (says he), they saw a number of prodigious pillars of sand at different distances, at times moving with great celerity, and at others stalking on with majestic slowness. At intervals the party thought they should be overwhelmed by these sand pillars, and small quantities of sand did actually more than once reach them. Again, they would retreat so as to be almost out of sight, their summits reaching to the very clouds. Their tops often separated from the bodies; and these when disjointed dispersed in the air, and did not appear again. They were sometimes broken near the middle, as if struck with a large cannon-shot. About noon they began to advance with considerable swiftness upon the party, the wind being very strong at north. Eleven of them ranged alongside, at about the distance of three miles from them; and at this interval the greatest diameter of the largest of them appeared to be about ten feet. It was in vain to think of fleeing: the swiftest horse, or fastest-sailing ship, would not have been of any use in rescuing Bruce from his danger. The full persuasion of this rooted him, as it were, to the spot, and he allowed the camels to gain on him so much that it was with difficulty he could overtake them.

On a subsequent occasion, an assemblage of these moving pillars of sand, more numerous but less in size than the former, approached Mr. Bruce's party soon after sunrise, and appeared like a thick wood. They almost darkened the sun, the rays of which, shining through them for nearly an hour gave them an appearance of pillars of fire. His people became desperate; some saying it was the day of judgment, and others, that the world was on fire.

SANDHURST, a pleasant village, about thirty miles from London, where is situated the Royal Military College for the education of gentlemen cadets, chiefly the sons of military officers. This College was originally founded, in 1802, at Great Marlow, co. Bucks; but in 1812 it was removed to

its present site. The building presents a splendid appearance. It has one grand front, with two wings, which form the residence of the lieutenant-governor and the hospital; and in the rear of the college is a large square, with houses for the residence of the officers of the establishment. For admission into the junior department of the college, there are two examinations; the one comprehends the first four rules of arithmetic, and the construing of the first Latin classics. The other examination comprehends the higher rules of arithmetic, embracing the rule of three, decimals, and vulgar fractions. The age of admission is from 13 to 16. A candidate for admission to the senior department of the college must be a commissioned officer in the army, and must have completed the twenty-first year of his age. He must have actually served as a commissioned officer with his regiment for three years abroad, or for four years at home. In conformity to the royal warrant, dated the 27th of May, 1808, all gentlemen cadets at the Royal Military College are subject to the Articles of War, and to such other rules and regulations as are, or may be from time to time, established for the maintenance of good order and discipline at the Institution.

SAP'ONITE (Lat. *sapo*, soap), a mineral occurring at the Lizard's Point, in Cornwall, which when first extracted is fictile, like clay or soap, whence its name; but it becomes brittle when dry, and assumes a variety of colours, as blue, red, or yellow. Its constituents are—silica, alumina, iron, magnesia, and potash.

SARDINIA (v. 574-9). The kingdom of Sardinia has undergone little change since the death of her sovereign Charles Albert, as noticed in p. 579. But the Sardinians have brought themselves into notice by their heroic conduct in the Crimea, when in 1854 they joined the alliance with England and France, against the aggressive claims of the colossal power of the north. The Sardinians have also called forth the sympathies of Europe by their resistance to papal assumption, and their defiance of the menacing attitude of Austria. Her present sovereign, Victor Emanuel, appears determined to promote the spirit of freedom, and establish his government on the enlightened principles of the age.

Galenga, in his 'History of Piedmont,' states that the population of the Sardinian kingdom is nearly five millions, of whom about half a million belong to Savoy, and about half a million to the island of Sardinia. The Austrian Lombardo-Venetian territory has the same number of inhabitants, within a few thousands, as the kingdom of Sardinia. The revenue of Sardinia is 130,000,000 francs, and the public debt nearly 600,000,000 francs. In the island of Sardinia the clergy are in the ratio of 1 to every 127 souls, and on the mainland 1 to 227. Exclusive of pupils in seminaries, novices, and others not in orders, the kingdom of Sardinia lately numbered 23,000 ecclesiastics, and the church revenue amounted to more than 17,000,000 francs. The education of the country is in a low condition, especially in the island of Sardinia, where scarcely a fifteenth of the people can read or write. In Piedmont half the population are uneducated. But the government is preparing to give attention to popular education, the revenues of the suppressed convents being partly designed for this object, the neglect of which removes all reasonable ground of complaint on account of the spoliation of the church.

SATUR'NIA, a sub-genus of insects belonging to the division *Bombycites*, of the third family of Lepidoptera, according to the classification of Cuvier. It comprises the largest species, which have the wings mostly ornamented with glass-like spots. Such is the great *Atlas Moth* of China, the silk of which the cocoons are formed having been employed for ages at Bengal. There are in Europe, according to Cuvier, five species of Saturnia, the largest of which is the great Peacock; the only British species being the Emperor Moth (*S. Pavonia minor*), which is a very pretty specimen of the genus. There is a peculiarity about the cocoon of this species. It is so formed internally with stiff elastic thread, as to facilitate the escape of the insect, and at the same time prevent the entrance of others.

SAUROIDICH'NITES (Gr. *σαῦρος* a lizard, *εἶδος* resemblance, and *ἰχθύς* a fish), in geology, those lizard-like fishes, the foot-prints of which have been discovered in the quarries along the banks of the Connecticut River, in the United States. Professor Hitchcock noticed twenty-seven species, which he so named from their resemblance to the tracts of Saurians, and Mr. Scrope found numerous footsteps on layers of the forest marble to the north of Bath.

SAVINGS BANKS (x. 602-4). Since the establishment of savings banks, in 1817, the total receipts, in 1858, had been 43,383,915*l.*; and the amount of interest paid and credited 28,851,993*l.*; making a total of 72,135,908*l.*; of which there had been paid to depositors 36,880,197*l.* On the 20th of November, 1857, there were 1,341,752 individual depositors, to the amount of 32,984,023*l.*, besides charities and friendly societies, the funds of which raised the deposits to 35,145,567*l.*

SCAMMONY (*Convolvulus Jalappa*, iv. 900). In a lecture lately delivered by Mr. Jacob Bell, at the Society of Arts, it was stated that pure Scammony is of very recent introduction into this country. This valuable drug has been subjected to a regular system of adulteration. When pure Scammony was exhibited at the great Exhibition of 1851, several foreign professors of medicine, and lecturers on materia medica, declared they had never previously seen pure Scammony, and expressed great satisfaction on obtaining a few ounces as a curiosity. The introduction of Mr. Bell's Lectures (says the editor of "Novelties, Inventions," &c.) arose from the circumstance of several samples of Scammony having been analyzed and found to be adulterated (chiefly with starch and chalk) to an extent varying from 15 to 60 per cent. The fact being reported to the merchant abroad, he replied that he 'made to suit the demand, and mixed it according to the price.' He said he would send it pure if desired, but it would be dear in proportion to its purity. From that time virgin Scammony, as it is called, has

been in the English market; but it has not yet found its way to the continent of Europe.

SCELIDOTHE'RIUM (Gr. *σκέλος* the leg, and *θηρίον* a wild beast), in Mammalogy, an extinct species of gigantic animal, whose remains have been found in the great Pampean formation of South America. One found near Buenos Ayres was as large as the rhinoceros, and resembled in its structure the armadilloes and the Cape ant-eater. It may be considered as a genus of the extinct Megatheridæ, so prevalent in the regions of Southern America.

SCHADOW, JOHANN GOTTFRIED, a German sculptor, of considerable eminence, was born at Berlin, in 1764. The most important of his works are the equestrian statue of Frederick the Great at Stetting; an equestrian statue of Field-Marshal Blucher at Rostoch; a statue of Luther at Wittenberg; the sculptured emblematic representations on the Mint, at Berlin; and a colossal statue of General Ziethen; with several busts of minor importance. Schadow was not only regarded as the patriarch of the modern school of art in Germany, but he is likewise held in high estimation as a writer who has enriched the literature of art by his numerous works, such as his 'Monuments of Statuary, Architecture, and Painting;' 'National Physiognomy,' &c. He died at Berlin in January 1850.

SCHAMANS, or, SHAMANS (Chald. *shemin* the heavens), the ancient worshippers of the heavenly bodies among the Syrians, Chaldeans, and Canaanites, whose idol was Baal-Samen.

SCHILLER-SPAR (Germ. *schillern*, emitting rays of light), a mineral of shining lustre, whence its name, and of an olive-green colour, with greyish-yellow streaks; specific gravity, 2·7; hardness = 3·5 to 4·0; its constituents—silica, magnesia, oxide of iron, alumina, and lime.

SCHOLEFIELD, REV. J., Regius Professor of Greek in the University of Cambridge, received his early education at Christ's Hospital, and was entered of Trinity College, Cambridge, in 1809. In 1815 he was elected a fellow of his college, and in 1825, succeeded Mr. Dobree as Regius Professor of Greek. He had previously obtained, in 1823, the incumbency of St. Michael's in Cambridge, the duties of which he discharged with undeviating zeal for thirty years. During that period he was chairman of the Managing Committee of the Refuge; Treasurer of the Servants' Training Institution; and of the Clerical Education Society; a leading member of the local association of the Church Missionary Society; the Church Pastoral Aid Society, and the British and Foreign Bible Society, &c. He was also the editor of many scholar-like editions of the Greek classics; among others, of Porson's Four Tragedies of Euripides (1826); Bishop Leighton's 'Prælectiones;' Petri Pauli Dobree Adversaria (1831); the 'Eumenides' of Æschylus (1843), &c. He died in April 1853.

SCHOOLS (x. 679). Under the heads of EDUCATION, and UNIVERSITIES of OXFORD and CAMBRIDGE, *Suppl.*, appear some brief notices of the present state of education in the country, and the changes which our great scholastic institutions have undergone. We shall now proceed briefly to recapitulate the progress of education as connected with our National Schools and our educational establishments in general.

At the head of the government schools we have the Committee of Privy Council of Education, which consists of the Lord President of the Council for the time being, the Marquis of Salisbury, the Duke of Northumberland, the Earl of Derby, Lord John Manners, the Right Hon. Spencer Walpole, Benj. Disraeli, and Joseph Henley. This Committee superintends the application of any sums voted by Parliament for the purpose of promoting public education, and supplying elementary books to those schools under government supervision. They also appoint inspectors to visit the schools receiving grants from the public purse. To all the schools existing in the country, National or Denominational, Protestant, Roman Catholic, or Jewish, the Committee makes grants to pupil teachers, establishes queen scholarships, and supplies the schools with books at reduced prices.

The National Society, which is connected with the Church of England, has training schools for teachers at Westminster, Battersea, Chelsea, Durham, Exeter, Oxford, Cheltenham, Carmarthen, Chester, Chichester, Carnarvon, Lichfield, Lincoln, Winchester, and Norwich. From a recent return it appears that there were, in 1847, 16,198 Church day-schools. The British and Foreign School Society, which receives aid from government, has only one school for teachers, viz. the Borough Road School in Southwark. The Congregational Board of Education was established in London in 1842, for the purpose of promoting popular education of a religious character; but it does not in any way partake of the public money granted by government. The Old College at Homerton, near London, which was first opened in 1852, is now the Training Institution for Pupil Teachers. The Voluntary School Association is a branch of the British and Foreign School Society, which, like the Congregational Board of Education, repudiates all government assistance. It has a Normal School at Wandsworth for the training of male teachers. The General Education Committee of the Wesleyan Schools have received several grants from the Committee of Council on Education, and their schools are very numerous. They have a large Normal establishment in Horseferry Road, Westminster, for the training of male and female students. The Roman Catholics have a training school at Hammersmith, and in different parts of England, Ireland, and Wales. They have about 300 public schools, besides seven or eight industrial ones.

The state of education and of public schools in WALES, according to the authority of Mr. Evan Jones, in his 'Facts and Figures illustrative of the Dissent and Morality of Wales,' is rather encouraging. He says 'that the Church, with the assistance of the aristocracy, endowments, and grants from the Committee of Privy Council, has provided 581 schools, whilst the almost unaided exertions of the poor have established no less than 949.' He then states that the Blue Books convey

a very different idea, and show 'a state of education only removed from ignorance the most intense;' but he considers the report of the Commissioners, who were unfortunately ignorant of the Welsh language, 'more highly coloured than was warranted by the facts of the case.' The inspector of schools in Wales, the Rev. H. L. Jones, in his report for 1851, states that 'the moral and intellectual condition of the schools within his district continues to show a steady, and, in some instances, a rapid improvement.'

'According to the last Parliamentary Returns,' says the report of the Education Committee on the Schools of SCOTLAND, 'there were 1047 schools, with an average attendance of 61,000. The number of non-parochial schools, exclusive of those of the Free Church, may be estimated at 4500, with an average attendance of 180,000 scholars. The Free Church Schools, receiving salaries or gratuities from the Education Committee, amount to 626, with an attendance of 55,395 children. The non-salaried schools are 190 in number, and are attended by 10,139 scholars, making in all 65,534.' According to the census of 1851, the number of scholars was estimated at 368,517, or one to every 7·84 inhabitants. At private day-schools there were 88,472 scholars; but at the public ones there were 280,045.

In IRELAND the progress of education, and the establishment of schools, has had many difficulties to encounter. 'For nearly the whole of last century (says the report of the Commissioners of National Education for 1839) the government of Ireland laboured to promote Protestant education, and no other.' Various schemes had been attempted to establish a government system of education; but sectarian feeling defeated them all. At length, in 1831, a Board of National Education was established, constituted of eminent men from all the religious creeds of Ireland. They were commissioned to draw up a regular system of instruction, and provide such elementary books as might be required; so that children of all creeds might attend the schools without any fear of proselytism. Liberal grants were made by the government; and in about two years this Board had established 789 schools, in which 107,118 scholars attended. In defiance of all opposition the system continued to prosper. In 1844 the Board of National Education obtained their Charter of Incorporation. During that year they trained in their schools in Dublin 260 male and female teachers. In 1845 the number of schools in operation was 3426, with 432,844 children. During the same year an important Act was passed for 'enabling her Majesty to endow New Colleges;' and, in pursuance of that Act, the Queen's Colleges of Belfast, Cork, and Galway, were shortly afterwards erected at an expense of 100,000*l*. The Commissioners of the Treasury were authorized to issue annually a sum of 7000*l*. for the payment of salaries and other expenses. From 1848 to 1850, the government grants for schools were annually 120,000*l*.; in 1851, 134,560*l*.; in 1852,164,577*l*.; in 1853,182,073*l*.; in 1854, 193,400*l*.; in 1855, 215,200*l*.; in 1856, 277,641*l*.; and in 1857, 213,000*l*. The 24th report of the Commissioners of National Education shows that at the end of 1857 there were 5337 schools in operation, with an average daily attendance of 268,397 children, and an average number of children on the rolls amounting to 514,445. The increase, since 1856, is equivalent to 14,386 children actually attending, and from 26,000 to 28,000 on the rolls. There were 13 'district model schools' at work in 1857, and 166 'national agricultural' schools. The amount expended from the Parliamentary grant in these latter schools was 6721*l*. The total receipts of the commissioners for the year amount to 302,224*l*., and the expenditure to 289,425*l*., leaving a balance of 12,799*l*.

Besides schools for purely educational purposes, there are several agricultural model schools established by the Board of Education, and also some ordinary schools, with land attached to them, in which the pupils are instructed in the science and practice of agriculture.

Thus at length we may entertain a sanguine hope that the educational position of Ireland will not rank the lowest in the United Empire.

SCHORZONERA (Span. *scorzon*), the Catalonian name of the viper), a genus of composite plants, of the sub-order *Tubuliflorœ*. The species, *S. Hispanica*, is the Viper-grass, which is supposed to be a specific against the bite of the viper.

SCIAGRAPHY (Gr. σκιὰ a shadow, and γραφὴ a description), the art of delineating or sketching an object, and at the same time throwing into the picture the proper light and shade, according to the laws of perspective. Sciagraphy is also a term applied to the art of dialling, or to the finding the hour of the day or night by the shadows of the sun or moon, &c.

SCIENCE (x. 686–7). The department of Science and Art in this country owes its origin to the great Exhibition of 1851, and is now connected with the Privy Council of Education. [SCHOOLS, *Suppl.*] In the speech from the Throne, on the opening of the Session of 1852–3, the intention of the government, to form some comprehensive scheme for the promotion of science and art was fully declared; and in March 1853 the Lords of the Treasury acceded to the proposal of the Privy Council to unite in one department 'the kindred and analogous institutions of the Government, School of Mines and Science, the Museum of Practical Geology, the Geological Survey, the Museum of Irish Industry, and the Royal Dublin Society, all of which are supported by parliamentary grants.' It was likewise arranged that all of them should be under the 'Board of Trade Department of Science and Art.' In February 1856, however, the whole department of Science and Art, by an order in Council, was transferred to the Committee of Privy Council on Education; and in 1857 the sum of 73,855*l*. was voted for this department. It now consists of two sections—a School of Science, and a School of Art. With the former are connected the museums and affiliated institutions, which have their head-quarters in Jermyn Street; and with the latter section are associated

the various scientific collections and schools, their head-quarters being at South Kensington, where are the offices of the Department, the various Art collections, the Art Library, the Normal Central School of Art, and the Training School for Masters and Mistresses. There are seven Metropolitan District Schools in connection with the Central School of Art, besides one school exclusively devoted to female students.

We shall now offer a few remarks on the necessity and the advantages of simplifying the nomenclature and elements of Science.

Some time ago the government appointed a Special Parliamentary Committee of the 'British Association for the Advancement of Science,' as already noticed under the article BOTANY (*Supplt.*), to examine 'whether any measure could be adopted by the Government or Parliament that would improve the position of Science or its cultivators in this country.' The report, as published in reply, strongly recommended a complete reform in the treatment of the physical Sciences, the formation of a Board of Science, and other important arrangements; some of which have been already carried into effect. But of all reforms, that of simplifying the nomenclature of Science would be the most useful; and this perhaps might be the especial province of the proposed 'Board of Science,' under the direction of the Committee of Council on Education. Simplicity of language, as applied to Science and Art, is the great master-key by which the portals of physical knowledge can be readily opened. A clear understanding of terms is an indispensable preliminary to the study of every department. Without it, the whole appears involved in a labyrinthian maze; but when this first obstacle is removed the path becomes smooth and easy.

One great difficulty attending the scientific lectures of our literary Institutions is, that the learned technicalities of modern science, as there in use, are unintelligible to the mass of the auditors. Hence arises the general complaint that such lectures are nearly always thinly attended. But let the terms of science be given in our own simple but expressive language, and the complaint would soon cease.

When that important serial, the 'Circle of the Sciences,' was first announced for publication (at 2*d.* per number), the subscribers fondly anticipated that the editors were about to apply the master-key to the lock which generally conceals the treasures of science, and thus unfold, in plain vernacular language, the great truths of nature. In the prospectus issued on the occasion, the publishers assured the purchasers that the work was designed for popular use; and that, therefore, the editor, and the various contributors, would 'endeavour to *clothe the whole series, and the scientific treatises especially, in simple language*; so as to render them easy introductions to practical studies.' But let us, for a moment, examine how this promise has been realized. Distinct treatises were issued on Physiology, Anatomy, Zoology, Geology, Botany, Chemistry, &c. Yet it was found that the same mysterious erudite language, which constituted the pedantic learning of the Middle age, was still pertinaciously preserved. Let us turn to one of the first articles of the series, entitled 'The Principal Forms of the Skeleton,' written by Professor Owen, who, as a popular lecturer, is considered a great authority in these matters. In describing a common vertebra, or spinal joint—a mere bit of bone,—in which we should expect the simplest language, the learned professor pours forth a torrent of Greek, which to twopenny readers, and especially the ladies, must be extremely edifying!

'The elements, or autogenous parts, of a vertebra,' says he (pp. 168–9), 'are the centrum, the neurapophyses, the neural spine, the pleurapophyses, the hæmapophyses, and the hæmal spine. The exogenous parts are the diapophysis, the parapophysis, the zygapophysis, the anapophysis, the metapophysis, the hypapophysis, and the epapophysis. Of the autogenous parts, the neural spine is most commonly exogenous. Of the exogenous parts, the parapophyses, diapophyses, and hypapophyses are sometimes autogenous.'

If this be the language of practical science, then the proprietors ought to issue a supplementary publication, announcing 'the Circle of the Sciences done into English,' somewhat in the following more intelligible language:—

'The elements, or self-existing parts, of a vertebra are the centre, the nerve processes, the rib processes, the blood processes, and the hæmal spine. The out-growing parts are the cross process, the transverse process, the junction process, the back process, the intervening process, the under process, and the upper process. Of the self-existing parts, the neural spine is most commonly outgrowing. Of the outgrowing parts, the transverse processes, the cross processes, and the under processes are sometimes self-existent.'

In the Zoological treatise of the cheap and popular serial just cited, the same pedantic technology generally prevails. Where the animals have Latin names, which happen to have their English cognates, they are generally intelligible; but the long Greek words applied to classes, orders, families, &c., enshroud the subjects, so far as ordinary readers are concerned, in perfect mystery. Thus the PROTOZOA are divided into the Rhizopoda, the Porifera, and the Infusoria; the RADIATA, into the Polypi, the Discophora, the Ctenophora, the Siphonophora, and the Echinodermata; the MOLLUSCA, into the Bryozoa, the Tunicata, the Lamellibranchiata, the Pteropoda, the Gasteropoda, and the Cephalopoda; and so on. Why not transform these Greek compounds into plain English ones, of which they are so readily susceptible, and say 'Root-footed' animals, instead of Rhizopoda; 'Radiated,' for Radiata; 'Shield-bearing,' for Discophora; 'Plate-gilled,' for Lamellibranchiata; 'Wing-footed,' for Pteropoda; 'Belly-footed,' for Gasteropoda; and so on; precisely as they have been translated in the present Cyclopædic volume, where the Greek compounds are uniformly reduced to simple English.

This method of compounding words constitutes

the very essence of the German language; and they very rarely adopt Latin or Greek in their scientific nomenclature. Thus the word *hydrography*, which we combine from the two Greek words ὕδωρ and γράφειν, is expressed in German by *Wasserschreib*, which is compounded of the words *Wasser* (water), and *Schreib* (writing). In the same manner the Germans express 'as cold as ice' by *eiskalt*; 'as hard as stone' by *steinhart*, and so on.

In the Botanical treatise of the work just mentioned, we have again the learned pedantry of past ages—the Monandria and Monogynia, the Diandria and Digynia of Linnæus;—the Thallogens, and the Acrogens, the Rhizogens, the Endogens, and the Exogens of Lindley, &c. [BOTANY, *Supplt.*]

The results of all this learned technology were precisely what might have been anticipated. The work, which was brought out in full anticipation that its very moderate price and intrinsic worth would ensure it a very extensive circulation, became eventually so circumscribed in sale, as not to reimburse the proprietor; consequently they were obliged to add fifty per cent. to the original charge, and thus to confine the work to the comparatively wealthier classes of society. But to meet the difficulties which the readers had to encounter, in endeavouring to understand what appeared to them the learned jargon of modern science, it was determined that a compendious *glossarial* index, explaining every scientific term, should accompany each treatise; and for this duty the editor of the present work was selected. But if these glossarial explanations were so absolutely necessary, the question may with reason be asked, why do we not adopt the simplified terms of our native tongue, as there given in explanation? Perhaps simply because there is no living individual of sufficient weight in the republic of letters who could successfully grapple with the subject. Nothing but a vast aggregate of talent and learning could accomplish it; nothing, perhaps, but a general 'Board of Science,' as suggested by the 'British Association,' or the establishment of an 'Anglo-National Academy,' the members of which would devote their talents and attention to the important task of simplifying the general nomenclature of science, could carry such a work into practice.

SCORESBY, DR. WILLIAM, the Arctic navigator, was born at Dundee, in 1790. His father being engaged in sea-faring pursuits, the son, at a very early age, was initiated in the naval craft. For many years the father and son sailed together in the ship *Resolution* of Whitby. In 1806 the vessel reached a higher latitude than had ever been reached before, being 81° 30′. In 1811 young Scoresby, at the age of twenty-one, was appointed to the chief command of the vessel. In 1820 he published the work which has established his name as one of the most enterprising polar navigators of the day, entitled 'An Account of the Arctic Regions, with a History and Description of the Northern Whale Fishery.' From this it appears he had made seventeen voyages to the Greenland Whale Fishery.

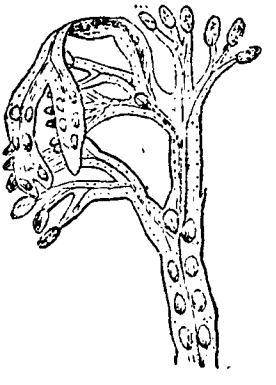
Feeling deeply impressed with the sacred truths of religion, Captain Scoresby soon afterwards entered the University of Cambridge as a student. In 1834 he took his degree of B.D., and eventually succeeded to that of D.D. He was next presented to the vicarage of Bradford in Yorkshiret and his 'Discourses to Seamen' evince the spirit and earnestness with which he devoted himself to the objects of his new calling. But of all the various matters to which the Doctor directed his attention, that of practical magnetism, and its connection with sea-faring purposes, was ever uppermost in his mind; and the various papers and works which he has published on the subject have fully established his fame as one of the first experimentalists of the age in the wonderful science of magnetism. He died at Torquay in March 1857.

SCOTLAND (x. 712–21). According to the census of 1851, the entire population of Scotland was 2,888,772: of which the males were 1,375,479, and the females 1,513,262. The inhabited houses were 370,308; and the area in square miles was 31,324. The population of each county is given under GREAT BRITAIN; and under each county will be found the population of the principal towns and parishes thereof.

According to recent agricultural statistics, the total acreage of 1856 was 3,545,721. Wheat occupied 70,000 acres, and there was an increase in stock of 160,352. In 1674 the land and house property was valued at 319,281*l.*; while in 1856 it was estimated at 8,155,972*l.*

SEA-WEEDS. [ALGÆ, *Supplt.*] The preservation of sea-weeds, many of which are beautiful specimens of marine vegetation, is a very pleasing and artistic kind of amusement; especially of such plants as the *Fucus vesiculosus*, or Bladder-wrack; the *Plocamium coccineum*, or Landscape weed; the *Sertularia operculata*, or Sea-hair; the *Delesseria sanguinea*, or Dock-leaved fucus; the *Sertularia abietina*, or Sea-fir, &c.

Of the semblance and general appearance of those just enumerated a tolerable idea may be formed from the annexed representations of a single stem of each plant.



BLADDER-WRACK.
(*Fucus vesiculosus.*)

LANDSCAPE WEED.
(*Ploeamium coccineum.*)

SEA-HAIR.
(*Sertularia operculata.*)

DOCK-LEAVED FUCUS.
(*Delesseria sanguinea.*)

SEA-FIR.
(*Sertularia abietina.*)

The *Fucus vesiculosus* (from the Greek φῦκος a sea-weed, and Lat. *vesicula* a little bladder) is the botanical name of the Bladder-wrack; *Fucus* being the type of the order *Fucaceæ*; all the species of which are very common on our sea-coasts, especially the *F. vesiculosus*, which is extensively employed in the manufacture of kelp; and in some of the Scottish islands, during the winter months, it is the principal sustenance of cattle, sheep, and horses.

The *Ploçamium* is so called from the Greek πλόκαμος (interwoven hair or fillets); and the *Sertularia*, from the Lat. *sertum*, a garland, or wreath. The *Delesseria* was so named in honour of M. B. Delessert, an eminent French botanical patron. It is a beautiful species of deep-green algæ, frequently found in abundance on the sea-shore after stormy weather. Indeed it is in this kind of weather, when the tumultuous ocean tears up the different plants from their native beds, that sea-side visitors stand the best chance of making a good selection of interesting sea-weeds. Many excellent specimens may be gathered in the pools upon the rocks at low water; for after a storm the beach is often strewed with them. When collecting plants of this kind, it is not necessary that much pains be taken at first in their preparation, because they can be moistened at a future period, and dried more carefully. Specimens can be picked up by travellers, dried in the air and shade, and then packed and carried home in a state to be finished at leisure. The final preparation is simple enough. In the first place the plants are to be well washed in *fresh* water, and then to be floated out in another vessel of clear water, and a card or stiff paper must be passed under them as they leave their liquid element for ever. Any little arrangement that is required of a particular stem is adjusted with a camel-hair brush. As they dry they will adhere to the paper, and may be handled without fear of being displaced. Those specimens which have no natural mucus to make them adhere may be readily attached with good gum, and subjected to a slight pressure. There are some sea-weeds, such as the *Sertularia abietina*, and the varieties of the *Desmarestia*, *Laminaria*, and the *Dulse*, which must be first soaked in salt and water, then dried in a towel, laid out on a table or board, and every portion of that which is to be the under side passed over with a camel-hair pencil dipped in a solution of gum-dragon. The gummed side must then be applied to the paper destined for the specimen, and the after-process is the same as above.

SEBASTIANI, HORACE FRANCIS, Marshal of France, one of Bonaparte's generals, and a distinguished diplomatist, was a native of Corsica, and born in 1776. He was originally intended for the priesthood; but at the stirring period of 1792 he was induced to enter the French service as a soldier. He first attracted the notice of Bonaparte in the Italian campaign of 1796, when he was made chef-de-bataillon for his bravery at Arcola. On 18th Brumaire he was of great assistance to Napoleon; and in 1800 and 1802 he was entrusted with some diplomatic missions of great importance, for which he obtained the rank of General of Brigade. He was engaged in most of the great contests with the Austrian armies, and with Murat's cavalry entered Vienna. He was one of the many French officers sent by the Emperor into Spain, to retrieve his falling fortunes, and he there greatly distinguished himself. He was also engaged in the fatal Russian campaign, and was one of the first to enter the great northern capital. But on the retreat of the French, Sebastiani lost his artillery, and all his horses perished. After the abdication of Napoleon, he retired from military life. But in 1819 he was elected deputy for Corsica, in the Chamber of Deputies; and in 1826 became the representative of the department de l'Aisne, enlisting himself on the side of what was known as the liberal opposition. On the accession of Louis Philippe, in 1830, he was appointed minister for foreign affairs, and in 1835 was sent as ambassador to London. In 1841, after forty-eight years' service, he received his baton de Maréchal. He died at Paris, in July 1851.

SEBASTOPOL (x. 778) has been the scene of many sanguinary conflicts between the allied armies of England and France on the one side and the Russians on the other; and as the siege forms one of the most memorable events of modern times, the following historical outline may be interesting.

War having been declared against the Czar of Russia early in 1854 [RUSSIA, *Suppll.*], in Sep-

tember following the allied armies left Varna, and landed in the Crimea on the 15th. [CRIMEA, *Supplt.*] They immediately proceeded southward, and on the 20th fought the battle of Alma, in which the Russians were defeated, and compelled to retreat towards Sebastopol. The allied forces then advanced southward; and on the 24th halted at the village of Belbek, where the Russians had taken up a strong position. But the allies took a *détour*, and proceeded unmolested to Balaclava, which was taken possession of on the morning of the 26th. On the 17th of October the siege of Sebastopol commenced. On the 25th the Russians made their appearance, to the number of 25,000, in the valley of Balaclava, with the evident intention of cutting off the besieging army from its base of operations; but the enemy were signally defeated. [BALACLAVA, *Supplt.*] On the 5th of November was fought the sanguinary battle of Inkerman, in which the Russians had an estimated force of 50,000 men. [INKERMAN, *Supplt.*] A suspension of hostilities took place during the winter months, when the English troops were exposed to great privations and suffering, principally owing to the mismanagement of the Commissariat, and the gross neglect of our home officials.

Early in the spring of 1855 the operations of the siege were resumed with intense vigour, and great slaughter took place on both sides. In the meantime an expedition was dispatched to Kertch and the sea of Azof, which caused much mischief to many of the Russian ports, and effected the destruction of *vast* stores of grain, wherever deposited. [KERTCH, *Supplt.*] On the 25th of May, 20,000 French troops, the whole of the Sardinian forces, and 20,000 Turks, expelled the Russians from the Tchernaya, and took possession of the heights. On the 6th of June, the Mamelon fort, which had proved a great annoyance, was captured by the French, and the English made good their footing in the Quarries. On the capture of the Mamelon, the trenches of the besiegers were pushed on towards the Malakoff Tower and the Redan, both of immense strength, and covering the town of Sebastopol. On the 16th of August was fought the battle of the Tchernaya, in which the Russians were defeated, with a loss of about 6000 men in killed and wounded. [TCHERNAYA, *Supplt.*] On the capture of the Malakoff by the French, on the 9th of September, the Russians evacuated the south side of Sebastopol, but previously burnt all the buildings, blew up the magazines, and destroyed the remaining ships of their Black sea fleet in the Sebastopol harbour. During this memorable siege, according to the authority of General Niel, the French artillery threw into the town 510,000 round shot, 236,000 shells from howitzers, 350,000 shells from mortars, and 8000 rockets; while the French infantry, during the Crimean war, fired 25,000,000 cartridges.

SECA'LE, in botany, a genus of cereal grasses, of which *S. cereale*, or cultivated Rye, is the most important. [RYE; TRITICUM.]

SELKIRKSHIRE, Scotland (x. 330–32). According to the census of 1851, the entire population of the county was 9809. Of inhabited houses there were 1331. The area of the county was 266 square miles, or 170,313 acres, of which about 85,000 are arable. The population of the two principal places is as follows:—

Selkirk . .	pa. 4347	Galashiels . .	5918
——— . .	bor. 3314		

SEMATOL'OGY (Gr. σῆμα a sign, or representation). The art of conveying ideas, or oral sounds, to the visual organs, by means of pictorial, emblematical, hieroglyphical, sentential, or written characters, may be termed *Sematography*, from σημάτων γραφὴ (character-writing); and a disquisition on the subject may, with equal propriety, be named *Sematology*, from σημάτων λόγος (a treatise on character-writing, or written signs).

In the history of the world it does not appear that any people ever existed, or could exist, without an oral language; but there have been, and still are, many without a written one. In the most barbarous stages of society man has early called into operation the common organs of speech, for the purpose of communicating his ideas, or expressing his feelings, to his fellow men. This is a faculty which the lowest savages of Africa, or the wanderers of the Arctic wilds, all physically possess, and call into action to a degree sufficient for the expression of their limited desires and simple ideas. But the acquirement of a method which should enable man to communicate his ideas through the medium of written *signs* or characters, independently of speech, has resulted from a certain degree of civilization, and been the slow progression of ages.

The fingers, accompanied by certain gesticulations of the body, were probably the earliest agents in communicating ideas to the visual organs. These, by their various configurations and positions [DACTYLOLOGY, v. 205] would naturally form a species of idiographic writing; which, in course of time, would become matured into a conventional system, similar, in all probability, to the verbal and sentential characters of the Chinese.

The flowers of the field, or the vegetable productions of nature, would next be called into general use, to express the various affections of the mind; and even at the present day the maidens of Spain and of Turkey are in the habit of employing these expressive and soul-speaking emblems of simple nature, in conveying their sentiments of regard, of friendship, or of love.

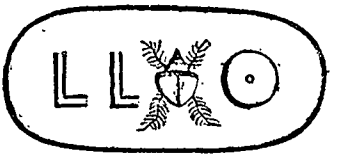
As society advanced in its social relations, and man became capable of delineating the common objects of nature by which he was surrounded, pictorial representations, as illustrative of passing events, &c., appear to have been brought into general use; and these, from their very simplicity and self-evident meaning, in speaking at once to the eye and understanding of all, would be intelligible to the humblest capacity. Thus among the Mexicans, even in modern times, passing events were recorded through means of professional draughtsmen and painters. It is related that on the landing of the Spaniards on the Mexican shores, a large painting of the whole army and their ships was sent to Montezuma; and the Spaniards, on afterwards discovering it,

were astonished at the accuracy with which the whole was executed. The interesting history of the new world, however, which was supposed to be embodied in the pictorial representations of the Mexicans, must for ever remain imperfect, owing to the barbarous zeal of the first Christian missionaries, who destroyed all the paintings that could be discovered, under the impression that they were the mere representations of idolatrous observances; and afterwards, when they became sensible of their error, and discovered that they were the national records, they made some attempts to collect the remains of these painted histories; but the patriotic Mexicans took especial care to conceal them from European inquiry.

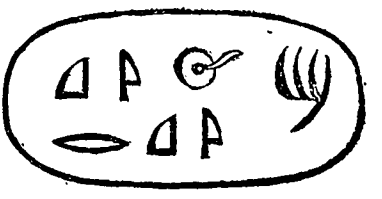
Among the Canadian Indians, also, of the last century, the art of pictorial writing was generally adopted for the purpose of illustrating passing events. During the last war with the French Canadians, the pictorial representation of an Indian expedition against a neighbouring tribe, was found on the person of a French officer, which gave, with admirable precision, the whole progress of the campaign. In the first compartment of the picture appeared a column of Indian warriors in marching procession, with the representation of the horned moon, to show the day of the month when the expedition was undertaken. In another compartment the warriors were depicted in boats, to indicate that they had proceeded along a river to the scene of action; with many other details represented in different parts of the picture. In one appeared a number of round cottages, to exhibit the population of the invaded settlement. Some of the Indians were represented as sleeping, to show that they had been surprised during the night; and some burning cottages evidenced that the invading party had set fire to the village. In another place the order of battle was depicted; and subsequently, the enemy was represented as entirely routed, with the number of the slain, of those taken prisoners, of the wounded, &c.

From this natural system of pictorial writing, which doubtless existed for ages anterior to the records of authenticated history, originated the numerous symbolic characters and emblematic representations of the astrologers, astronomers, theologians, magicians, and alchemists of old; and which appear, in some degree, to be perpetuated among heralds, freemasons, almanac-makers, chemists, conjurors, and charlatans of every grade.

From pictorial writing, too, the hieroglyphics of Egypt and Ethiopia had doubtless their origin. Thus the sun, moon, and stars, as being the most sublime and striking objects in nature, became the symbolic representations of gods and kings. Mathematical figures, also, were the symbols of particular attributes; as the quadrangle was the emblem of wisdom; the circle, of the universe; the triangle, of divinity; the winged serpent, of the spirit of the universe, &c. Among animals, the lion indicated strength; the tiger, ferocity; the sphinx, the human mind; the dog, watchfulness; the fox, cunning; the goose, stupidity; the eagle, majesty; the scarabæus, fecundity, &c., &c. The difficulties, however, of epistolatory correspondence, and of expressing proper names, eventually superinduced a mode of writing, called *epistolographic*, or *demotic*, which appears to have consisted in merely simplifying the formation of the figures of hieroglyphic writing, and reducing them to characters better calculated for imparting facility to correspondence. Thus the two modes of writing are clearly developed in the celebrated inscription recorded by Ptolemy on the Rosetta Stone now exhibited in the British Museum. It appears, however, from the discoveries of Dr. Young, Champollion, and others, that the figures of the hieroglyphic and the characters of the demotic writing not only represented ideas, or words (as the sentential and verbal writing of the Chinese), but were likewise the representations of phonetic sounds, or alphabetic letters. As an illustration, we will give the inscription of Rameses, consisting of the consonants, R, M, S S, and reading from right to left, according to the Oriental mode:—



Thus we perceive that the sun represents the letter R, which is the initial of *Re*, the Coptic name of the sun; the scarabæus (in Coptic *Mes*) represents M; and a pair (*Sheth*) of feet-like characters denotes the letters S S. In the same manner, if it were necessary to give the name of George IV., we should write thus (reading from left to right, according to the system of Western nations):—



G being denoted by a quadrant, Δ, that letter forming the initial of the quadrant in the Coptic; *E* by a knife, *O* by a lotus-bulb, ; *R* by a shuttle, , &c.; and the number IV. by four perpendicular lines, as in our Roman numerals.

A species of pictorial and symbolic writing, not unlike the Egyptian, appears even to have existed among our Saxon Ancestors previously to the general adoption of the Roman alphabet, as may be seen from the representation of a Saxon almanac, known by the name of a *Staffordshire Clog*, which contains pictorial or emblematic representations of the various Saints' days, &c. [Almanacs, *Supplt.*] These pictorial or hieroglyphic almanacs doubtless originated from the general practice which early prevailed in the Romish Church (when the communicants were

unable to read) of representing, by pictures, the leading subjects of Scripture, or the most striking events in the lives of the saints. This mode of addressing the senses, and impressing the most important points of religious or legendary history on the memory, was, in those ages of unlettered ignorance, found the most effectual and impressive.

The origin and adoption of the Roman Numerals, which were probably in use among the Romans before their knowledge of letters, are purely of a sematographic character, as fully explained under the head of NUMERALS, p. 750, *Supplt.*

Having briefly noticed the early methods of conveying ideas to the senses by means of pictorial, hieroglyphic, or symbolic representations, as practised by the Mexicans, Canadians, Egyptians, and Saxons, or by arbitrary, sentential, or verbal signs, as adopted by the Chinese, we have now to direct attention to one of the noblest inventions that ever emanated from the human mind—the art of communicating ideas through the medium of simple alphabetic characters expressive of vocal sounds. [ALPHABET, i. 537–54.] This invention, which effected so complete a change in the literature of the great nations of antiquity, from its extraordinary powers in conveying to the mind the most complex ideas, has been considered so far above the ordinary faculties of inventive genius, as to be attributed by many to divine origin. Although it is positive that our modern alphabet was derived from the Greeks, through the medium of the Romans, the original invention of letters is beyond the records of history. It has been respectively attributed to Taaut of the Phœnicians, to Moses of the Hebrews, to Memnon of the Egyptians, and to Cadmus of the Greeks; but these distinguished individuals in reality can only be considered as having improved, or perpetuated, an art which had, in all probability, been transmitted from the remotest periods of the world. 'Whoever was the inventor of the divine art of expressing ideas by alphabetic or written characters,' says the author of the 'Classical and Archæological Dictionary,' 'it is a melancholy reflection that his name, unhonoured by posterity, has been hurried down the impetuous stream of time into the vast ocean of eternal oblivion.'

Pliny, who is a great authority in these matters, says that the early Assyrians had a knowledge of letters—('literas semper arbitror Assyrias,')—but of what character these letters were he does not state; nor does he give any positive authority for his assertion. But of late years some light has been thrown upon this subject by the discovery of some ancient Chaldean bricks or tiles, which appeared to have formed the foundation of Babylon, about 2000 years B.C., many of which are now deposited in the British Museum. The inscriptions appear in vertical columns divided by lines. The characters are of that description usually called *Persepolitan*, or *arrow-headed*, from their peculiar shape, and by the French 'caractères à cloux,' or *nail-headed*. 'The spaces between the characters, as well as the proportions of the characters themselves,' says Dr. Hagar, the celebrated Orientalist, 'vary in bricks not impressed with the same stamp;' which fact strongly favours the presumption that a system of alphabetic characters was employed in these impressions, and that they were not mere symbolical representations of particular objects.

But the numerous discoveries of Mr. Layard on the presumed site of ancient Nineveh [NIMROUD, *Supplt.*], have thrown considerable light on this interesting subject. Many of the Persepolitan inscriptions have been clearly deciphered by the labours of Major Rawlinson and other Oriental antiquaries. They are now deposited at the British Museum, and will well repay the trouble of inspection.

Of all the nations of antiquity, Phœnicia appears to have the best claim to the invention of an alphabet, about 2178 years B.C.; from this descended the ancient Pelasgian; thence the Greek, Etruscan, and Roman; and from these originated, with trifling modifications, all the alphabets of the Western world. It cannot, however, be maintained that all alphabets, without exception, are derived from the same source; yet it is generally admitted that by far the greater portion of those used in various parts of the world were originally from the Phœnician; and it is a most astonishing feature, in the history of ancient and modern writing, that for near 4000 years the various alphabets in use, from the time of the Pelasgians to this very day, should so strikingly assimilate in form and character. [ALPHABETS, i. 547–54.]

Besides the invention of letters there was only one thing wanting to give perfection and sterling value to Sematography, and that was the art of PRINTING, which promises to render the moderns, in the universality of knowledge, infinitely superior to the wisest nations of antiquity.

SEPARATION, JUDICIAL. [DIVORCE, COURT OF, *Supplt.*]

SEPOYS (x. 854). Since the great rebellion of the native troops in India, the military strength of these Sepoys is almost annihilated. [HINDUSTAN, *Supplt.*] The origin and meaning of the word, since the late Indian outbreak, has not failed to excite public attention. Bishop Heber, as well as Thornton, in his Glossary of Hindustanee terms, says that it was derived from *sip*, a bow; but this derivation has been corrected by Syed Abdoollah, professor of oriental languages, who maintains that there is no such word in the Persian or Indian tongues. He says that Sepoy is derived from the primitive Persian word *Sipah* or *Sipahi*, which means a fighting man, a soldier, a feudal lord, or military tenant. The word appears to have been a very ancient one, and used by the earliest Persian writers; the plural being applied collectively in the sense of army or soldiery. The term *Sipah Salar* is applied to the commander of an army, or the commander-in-chief.

SEPPINGS, SIR ROBERT, F.R.S., &c., late surveyor of the navy, was born in 1768, and educated as a ship-builder under Sir John Henslow. He is celebrated as a naval architect, and

distinguished for his many valuable improvements in ship-building; especially for his plan of diagonal bracing and trussing, which he adopted and carried to perfection while engaged in the Chatham dockyard as master shipwright. When connected with the Plymouth dockyard he invented a simple and improved block for supporting vessels, while their keels and lower timbers were being examined and repaired. For this invention the Admiralty presented him with 1000*l.*; and the Society of Arts awarded him their gold medal. He introduced many other improvements in naval architecture; but the most important, perhaps, was the substitution of round sterns, which impart greater strength to the general framework of the vessel, and afford many other advantages, that are duly appreciated by naval authorities. He died at Taunton in 1840.

SERF (Fr.), a bondman or slave employed in cultivating the soil, for the exclusive benefit of the lord; and attached, in some countries, as in Russia and Poland, to the estate like goods or cattle. The present Emperor of Russia, however, has been devoting his earnest attention to the emancipation of these serfs; and with this object he lately caused a report to be made of the number of serfs in Russia. From this, it appeared that out of 127,000 landholders, 2000 of them possess from 1000 to 10,000 serfs; 2000 from 500 to 1000; 18,000 from 100 to 500; 30,000 from 20 to 100; and 75,000 have less than 21. The total number of peasant serfs of the nobility amounts to 11,760,000, and those of the Crown to 9,000,000. This system of serfdom, which still so extensively prevails among the Sclavonic races, had its origin in the slavish customs of the feudal ages. These serfs were then the absolute property of their lords. They could not go to settle out of their master's estates; nor could they marry a woman from the estate of another lord, without paying for the right. The custom prevailed most extensively among the ancient Franks, who, after they had conquered Gaul, sent their serfs to cultivate the lands which had fallen to them by lot. They were called 'men addicted to the glebe;' and it was by these serfs that France was afterwards peopled. They multiplied fast, and consequently their villages and farms were multiplied in proportion. The spots which they inhabited retained the name of *villæ* (Fr. *ville*), the appellation which the Romans had given them. From *villæ* and *villani* were derived the words *villager* and *villains*, which signifies those who inhabit the country, or people of low extraction. [VILLAINS, *Suppl.*]

Among our Saxon and Norman ancestors, these serfs were of four kinds; viz. such as sold themselves for a livelihood; debtors that were to be sold for being incapable of paying their debts; captives in war, employed as perfect slaves; and *Nativi*, or such as were born servants, and by descent belonged to the property of the lord. All these had their persons, their children, and goods, at the disposal of their lords; and were incapable of making any wills, or giving away anything.

SERVITIA, or SERVICES, in the feudal ages, certain duties or obligations which the tenants of the lord had to perform. Bracton mentions a variety of these services; as the Free and Base; the Real and Personal; Annual, Continual, Casual, or Accidental, &c. Personal services were homage and fealty. Annual services were rent, or suit of court; and accidental services were heriots, reliefs, &c. There were also services of a still higher nature; as the 'Servitium Regale' (royal service), and the 'Servitium Liberum' (free service). The former was the prerogative that within a royal manor belonged to the lord; as the power of judicature in matters of property; and of life and death in felonies and murders; right to waifs and estrays; minting of money; assize of bread and beer; and weights and measures; all which privileges were annexed to some manors by grant from the king. The 'Servitium Liberum' was a service to be done by feudatory tenants, who were called *liberi homines*, and distinguished from vassals, as was their service; for they were not bound to any of the base services of ploughing the lord's land, &c., but were to find a man and a horse, or go with the lord into the army, or to attend his court, &c.

SERVITUDE, PENAL. [TRANSPORTATION, xii. 231–42.] By stat. 20 and 21 Vict. c. 3, the punishment of transportation was abolished, and penal servitude substituted; but the law which appertains to the one also applies to the other; the punishment in both cases being nearly the same. The system originated from what is called 'Tickets of leave,' which were first granted to the convicts of Van Dieman's Land, New South Wales, and Norfolk Island, who, by virtue of these tickets, had permission to employ themselves, as best they could, for their own benefit; and by stat. 6 and 7 Vict. c. 7, were protected in their persons and such property as they could realize by their own industry. By stat. 10 and 11 Vict. c. 67, offenders under sentence of transportation might be removed to any prison or penitentiary in Great Britain; and owing to the strong opposition expressed by the colonies to the reception of transported convicts, it was enacted by stat. 16 and 17 Vict. c. 99, that the punishment of transportation for less than fourteen years should be altogether abolished; when penal servitude at home for certain periods, at the option of the courts, was substituted. At the same time, with the view of encouraging good behaviour in convicts, the statute empowers the secretary of state to grant licences or 'tickets of leave' to well-behaved convicts, who are thus permitted to be at liberty for the remaining term of their punishment; or so long as they shall properly conduct themselves.

SESQUI (Lat.), a prefix used in chemistry, and also in music, to denote one and a half. It is thus applied to those compound substances, in which there is one proportion and a half of oxygen, hydrogen, or chlorine, to one of the base, as in sesquicarbonate of ammonia, which contains one and a half proportions of carbon to each one of ammonia. (Craig).

SESSIONS (x. 877–80). By stats. 11 and 12 Vict. c. 78; 12 and 13 Vict. c. 45; and 14 and 15 Vict. c. 55, several fresh regulations have been introduced for amending the procedure in Courts

of Quarter Sessions. These Courts are empowered to reserve questions of law for the consideration of the Court of Criminal Appeal, and to order payments by way of reward for the apprehension of offenders. Further provisions are also made for the holding of petty sessions in counties and boroughs, and for regulating the fees of justices' clerks.

SETHIANS, an early Christian sect, so called because they pretended to deduce their origin from Seth, son of Adam, whom they called Jesus Christ, from an opinion that the same person came down twice from heaven. They were a branch of the ancient Gnostics.

SEVEN YEARS' WAR, a term often used in history as applied to the protracted and sanguinary contest which took place between Frederick the Great of Prussia and the Austrians during the middle of the last century, and in which most of the continental nations were more or less engaged.

SEWERAGE. [LONDON, *Supplt.* p. 660.]

SEWING MACHINES are among the many ingenious contrivances of the age to facilitate the labours of industry, and assist in the rapid production of textile fabrics; such as bed-linen, dresses, shirts, coats, waistcoats, &c. To whatever extent, however, these machines may affect the value or the interests of labour, one thing is certain, that during the pressure of the late war they were found of immense advantage in the rapid production of many of those articles of clothing, bedding, &c., which are necessary for the comforts of the soldiers. What is still more satisfactory, there were more sempstresses employed, and at better wages, than at any previous period, when hand labour alone was in use. It is stated, among other instances of rapid production, that the materials of a large number of shirts, required for the army in the Crimea, were sent to one house in the City, where these machines are employed for stitching and hemming, and they were finished off at the rate of from 1000 to 1500 per day. About thirty women were employed in the work, who thus accomplished about three miles and a half of stitching per diem.

The construction and operations of these curious machines, of which there are various kinds produced by different manufacturers, have been described by the editor of 'Novelties, Inventions,' &c. He first mentions that of M. Magnin Villefranche, an ingenious Frenchman. 'The piece of cloth,' says he, 'is laid down flat upon a cushion; the sempstress who works the machine sits at a kind of lathe, on which the cushion is laid, and works a treadle with her foot; at each movement of the treadle a needle descends vertically and pierces the cloth, carrying with it a thread; the needle has a small hook or notch on one side, which catches and brings up a thread on its return from the hole; and thus two or three hundred times in a minute, a thread becomes interlaced in the manner of "chain-stitch" or "tambour-work." The machine, which costs twenty or thirty guineas, can embroider as much cloth in an hour as an embroidress can complete in a day.—Another French machine, by M. Seneschal, of Paris, is more complete in its construction, and is intended for sewing coarse cloth. Great ingenuity is shown in the arrangement of the several parts; the machine pierces its own holes, inserts its own thread, tightens the thread after insertion, and shifts the cloth as the work advances, at the rate of forty or fifty stitches a minute. In England, too, there is Barlow's patent stitching machine, for making articles of dress; two distinct threads are used, one at the front and the other at the back of the fabric; so that each stitch forms an independent fastening. There is Judkin's sewing machine, said to be "suited to sewing either a circle, curve, or straight line, at the rate of 500 stitches per minute." There are racks or toothed arms employed, straight or curved, according to the shape of the work to be done. There are two threads, one in a reel, and one in a shuttle; and a needle ingeniously entangles these threads one in another through the holes pierced in the cloth.'

These machines are constantly undergoing the processes of improvement, and, to some extent, are gradually superseding the hand-labour of the needle. Although the machine may be unable to imitate all the processes worked by the hand, it can completely execute every part of a shirt, a waistcoat, a coat, or a pair of trousers, and, indeed, most of the plain surface of any kind of dress. The machines, however, as the editor of the 'Spectator' says, in a very able article on the subject, 'do not make the article themselves: the human head is still required; and it is a fact most important for the influence of the machine on the condition of the working class, that the woman who has been a good sempstress with the needle proves to be the best workwoman for the same purpose in the use of the machine. The machine cannot make a coat, but it can execute every part of the coat, except the button-holes, in the hands of a good tailor.'

SEXUAL SYSTEM OF PLANTS. [BOTANY, *Supplt.*]

SHARKS. [SQUALIDÆ, xi. 335.]

SHARPE, DANIEL, F.R.S., F.L.S., and President of the Geological Society, was born in London, in 1806. In early life he evinced an ardent thirst for every species of knowledge connected with natural history, but more especially with geology. He was the author of a great number of papers and erudite dissertations on the Silurian and Old Red Sandstone rocks of Wales and the north of England; on the Bala Limestone, and other portions of the older Palæozoic Rocks of North Wales; on the slaty cleavage and foliation which affects the more ancient rocks of Wales, Devonshire, the Highlands of Scotland, and Mont Blanc, &c. He died in May 1856.

SHAWL, a loose covering, or large kerchief, for the shoulders and back, which originally came from India, and now forms part of the modern female dress in Europe; although Indian shawls, with their beautiful colours and skilful workmanship, are still appreciated by those who possess the means of purchasing such costly commodities. The history and progress of shawl manufacture is an important feature in the industrial and social economy of the United Kingdom. It was towards the close of the last century that Norwich under-

took the manufacture of shawls in imitation of those of India; and a few years afterwards the town of Paisley began the same kind of manufacture. Still the French shawls continued to be preferred by those who could not purchase the costly ones of India. It was not until the manufacture of shawls was facilitated by the Jacquard looms, which produced them at a quicker and cheaper rate, that our home-made goods became so extensively patronized. The pleasing variety of patterns, too, is rendered still more striking by the recent introduction of printing, as the means of producing the beautifully-coloured samples. At Crayford, Merton, and elsewhere, the process of block-printing is extensively carried on; by which shawls of exquisite beauty are produced.

SHEE, SIR MARTIN ARCHER, the distinguished artist, and President of the Royal Academy, was born in Dublin, in 1770. He entered upon his destined career at the early age of sixteen, as a portrait painter in his native city. In 1788 he came to London, and entered himself as a student of the Royal Academy, of which he was elected an Associate in 1798, and an Academician in 1800. During this period he chiefly supported himself by portrait painting. In 1805 he appeared before the public in the character of a poet, and brought out his 'Rhymes on Art, or the Remonstrance of a Painter,' which received the praise of Lord Byron, and was a good deal read. In 1814 he published a small volume of poetry, entitled 'The Commemoration of Sir Joshua Reynolds, and other Poems.' He afterwards tried his hand as a dramatist and a novelist, but with little success. On the death of Sir Thomas Lawrence, in 1830, Shee was elected President of the Royal Academy. He pursued his profession as a painter till 1845, in which year he exhibited five pictures at the Royal Academy. Yet, after all, Shee does not appear to have taken a leading position among the painters of our English school of art. He was looked upon more as an accomplished gentleman than a great painter. He died in August 1850.

SHEEP (x. 929–37). The 'Agricultural Gazette' gives the following statistics of the number and value of sheep in the British Isles. 'England alone,' says the writer, Mr. F. Dun, 'possesses about 27,000,000; Scotland, according to the agricultural statistics of 1854, has 4,787,235, and Ireland, in 1853, had 3,142,656. Calculating the 35,000,000 as worth 30*s.* a head, the sheep stock of Britain is worth 52,000,000*l.* sterling. About 10,000,000 of sheep, weighing on an average 80 lbs. each, are annually slaughtered for food. This furnishes 800,000,000 lbs. of mutton, or on an average rather more than half a pound per day for each individual in the three kingdoms. The mutton at 6*d.* per pound is worth 20,000,000*l.* sterling. Professor Low estimates that, allowing for the deficient weight of the wool of slaughtered sheep and lambs, each fleece averages 4½ lbs., and the total annual produce of wool will therefore be 157,000,000 lbs. Fixing the value at 1*s.* 3*d.* per pound, the total yearly value of the wool of Great Britain is nearly 10,000,000*l.* sterling. Besides this large home growth, about 40,000,000 lbs. are annually received from Australia, and about 10,000,000 or 12,000,000 lbs. from the Cape of Good Hope and British India.'

SHEERNESS (vii. 712). In 1848 a line of fortifications, a mile and a quarter in length, and mounting 118 guns of the largest calibre, was completed.

SHEET-GLASS. Birmingham is one of the principal seats of our sheet-glass manufacture. It had been previously adopted in France and Belgium; but was introduced into this country by Messrs. Chance of Birmingham, about a quarter of a century ago. The process and details of this manufacture are very curious; and they have been thus described by the author of 'Novelties, Inventions,' &c.:—'The workman,' says he, 'dips his iron tube into the semi-viscid glass, and takes up a quantity amounting to 12 or 14 lbs.; he rolls the mass on a wooden block, till it assumes a cylindrical form; he applies his mouth to the other end of the tube, and blows until the mass assumes a hollow ovoid form; he whirls this round his head, or rather in a vertical circle ten or twelve feet in diameter, and elongates the ovoid into a cylinder with round ends; he reheats the glass two or three times during these processes, to maintain the proper consistency, and at length the remote end of the hollow mass gives way, and we have before us a cylinder of glass, attached only at one end to the tube. The cylinders are dissevered from the tube, and are cut lengthwise with a diamond; they are placed in a kiln, where the heat gradually opens the fissure, and there is finally presented a flat piece of glass, which can be cut to any smaller size.'

SHEIL, RIGHT HON. RICHARD LALOR, was born at Dublin in 1793. His education was commenced at Stoneyhurst, and completed at Trinity College, Dublin. With the prospect of being called to the English bar, he entered and kept his terms at Lincoln's Inn; but domestic misfortunes compelled him to return to Ireland; and in 1814 he was called to the Irish bar. Being in limited circumstances he devoted himself to dramatic composition; and several much-admired pieces were the result of his pen. The first was the tragedy of 'Adelaide,' which the great histrionic powers of Miss O'Neill rendered temporarily successful. This was followed by the 'Apostate,' 'Bellamira,' and 'Evadne,' which produced him about 2000*l.*

Though Mr. Sheil attained the rank of Queen's Counsel, he appears to have made little progress at the bar—his pleadings being considered more oratorical than juridical. Instead of an eminent lawyer, therefore, he became an eloquent political agitator; and from 1822 to 1828 was an active supporter of the Catholic Association. Many of his speeches were so violent that a prosecution was commenced against him, which was only arrested by the sudden death of Lord Liverpool. On the return of Mr. O'Connell as member for Clare, in 1828, in defiance of the then existing laws, a great meeting was held at Penenden Heath, near Maidstone; at which Mr. Sheil attended, but could not obtain a hearing. The passing of the Roman Catholic Relief Act, however, opened

a new and more extended field of action. In 1829 he was returned to Parliament as member for the borough of Milborne-Port. He soon became a favourite orator of the House of Commons, and was recognised as one of its principal ornaments. In 1831 Mr. Sheil was returned for Louth, and in 1832, 1835, and 1837, for the borough of Tipperary, for which he continued to sit till 1841. From the general election in 1841, till the time of his departure on a political mission for Florence in 1850, he represented the small borough of Dungarvon, always supporting the most liberal section of the Whigs. In February 1838 he was appointed one of the Commissioners of Greenwich Hospital. In March 1839 he accepted the office of Vice-President of the Board of Trade, and was sworn a Privy Councillor. In June 1841 he was removed to the post of Judge-Advocate General, which he held only till the following September, when the Ministry went out. On the return of a new Whig Ministry to office, in July 1846, he was appointed to the office of Master of the Mint; and in Nov. 1850 he accepted the post of British Minister to Florence. Although the appointment to Florence was nothing less than an expatriation of the individual, and an extinction of what might have been a growing fame, yet he submitted not merely with a philosophical indifference, but almost in a joyous spirit, feeling, or seeming to feel, that it was a great promotion, and a dignified retirement. He died in 1851.

SHELLEY, MARY WOLLSTONECRAFT, wife of Percy Bysshe Shelley, and daughter of William Godwin, was born in 1798. Her first production was the romance of 'Frankenstein,' which she wrote during her tour in Italy with her husband. After his death she brought out 'Falkland,' 'The Last Man,' and 'The Fortunes of Perkin Warbeck.' She also published an account of her travels with her husband, entitled 'Rambles in Germany and Italy.' In 1839 she produced an edition of Shelley's poetical works, and in 1840 a selection from his correspondence and prose compositions; in all of which she speaks most affectionately of the amiable qualities and natural goodness of her departed husband. She died in London, in February 1851.

SHERWOOD, MRS. MARY MARTHA, the versatile writer of tales, was the daughter of the Rev. Dr. Butt, rector of Stanford, co. Worcester, where she was born in 1775. In 1803 she was married to her cousin, Captain Henry Sherwood, of the 53rd Foot, and with him proceeded to India, where she zealously devoted herself to the cause of religion among the soldiers and natives by whom she was surrounded. On her return to England, she assiduously applied herself to her favourite pursuit of authorship, and produced, among other favourite works, the tales of 'Henry and his Bearer,' 'The Lady of the Manor,' 'The Church Catechism,' 'The Nun,' 'The Fairchild Family,' 'The Golden Garden of Inestimable Delight,' &c. Her husband, Captain Sherwood, after a protracted illness, expired at Twickenham, in December 1849. The fatigues she experienced, from her never-ceasing attention to him and the grief of her bereavement, tended to hasten her dissolution, which took place in November 1851.

SHIBBOLETH (Heb.), in Scriptural history, a word which was made the criterion by which the Ephraimites were distinguished from the Gileadites; the former not being able to sound the *sh*, but pronouncing the word *sibboleth* (Judges xii. 5). It is related that those Israelites who dwelt beyond Jordan had gained a great victory over the Ammonites, when the Ephraimites demanded part of the spoil. This being refused, the Ephraimites quarrelled with them, and the Gileadites being exasperated fought and defeated them. They then secured all the passes; and when an Ephraimite attempted to cross the river they asked him if he was of Ephraim? If he said No, they bade him pronounce the word *shibboleth;* and if he pronounced it *sibboleth*, they immediately killed him. 'It is probable,' says Calmet, 'that the word signified the fords or ferries over the water; and that the Ephraimites were made to repeat their request for passage several times, and were detected by the variations they uttered.' The word is still in use, as the criterion of a party, or as applicable to any peculiar difficulty.

SHILLING (Sax. *scilling*, Germ. *schilling*), an English silver coin, equal to the twentieth part of a pound, and worth 12 pence. It weighs 3 dwts. 15·27 grains. A pound troy of standard silver, consisting of 11 oz. 2 dwts. pure silver and 18 dwts. alloy, is coined into 66 shillings; so that each shilling weighs 87·27 grains. On the Continent our shilling passes for 10 silver grosschen in Prussia; 1 franc 20 centimes in France; 58 cents in Holland, and 35 kreutzers in Frankfort. The following is a return of the number of shillings coined at the Royal Mint from 1848 to 1856 inclusive:—

1848 . .	194,040
1849 . .	645,480
1850 . .	685,080
1851 . .	470,071
1852 . .	1,306,574
1853 . .	4,256,138
1854 . .	552,414
1855 . .	1,363,499
1856 . .	3,168,000

SHIPS, and SHIPPING. Numerous statutes, appertaining to our ships and shipping trade, have been cited (x. 963-72); but they have nearly all been repealed by stat. 17 and 18 Vict. c. 120, although the laws relating to contracts, and the obligations of owners, masters, seamen, and passengers, remain nearly the same as formerly; being regulated, in a great degree, by subsequent statutes. Thus the Merchant Shipping Act of 1854 is considerably altered and amended by statutes 18 and 19 Vict. cc. 91 and 119; to which those who are particularly interested in these matters are referred. They may be said to constitute in themselves a complete code of shipping and commercial law.

The repeal of the navigation acts, which had been passed for the purpose of monopolizing the shipping trade of Europe, effected a great change in our commercial relations. It entirely broke down that exclusive conservative principle which

had for ages pervaded our social system. One of the first measures enacted in favour of free commerce, was that which limited the exclusive privileges of British shipping to the coasting trade of the United Kingdom (stat. 12 and 13 Vict. c. 29); but the more decided enactment, that altogether abrogated the old navigation laws, was stat. 16 and 17 Vict. c. 107, which opened the trade and commerce of the empire to the shipping of the whole world. The immense advantages thence arising, and the vast increase of our shipping trade, have now become manifest, as may be seen from the official returns of the Board of Trade, who exercise a general superintendance over all matters relating to mercantile shipping; and also from the following comparative estimates of our shipping trade.

About fifteen years ago the British and foreign shipping, which entered into and cleared from our ports, was estimated at 9,824,562 tons. In 1857 it had risen to 23,178,782 tons. In other words, it had increased one hundred and thirty-six per cent. in fourteen years. The British tonnage of 1857 was greater by about three and a half million tons than the united British and foreign tonnage which entered into and cleared from our ports in 1843. This increase has not been the result of any sudden impulse given to maritime enterprise, but has been steady and gradual. In 1857 there were 9676 British sailing vessels of 767,925 tons, and employing 37,138 men; with 338 British steamers, of 92,481 tons, and employing 6462 men, employed solely as home-trade ships; 1098 sailing ships, of 162,112 tons, and 66 steamers, of 20,859 tons, were employed partly as home traders and partly as foreign traders in 1857. The Irish trade in 1857 employed 18,429 sailing ships and 899 steamers, with 151,434 men in the former, and 24,953 in the latter. The total number of sailing vessels and steamers together, was set down at 19,328, the tonnage at 4,211,482, and the number of men employed, exclusive of masters, at 176,387. In 1858, 10,313 sailing ships, of 788,113 tons, and navigated by 37,971 men, with 372 steamers, of 90,739 tons, navigated by 6215 men, were employed solely as home-trade ships; 897 sailing vessels and 62 steamers were employed partly as home and partly as foreign-going ships; 7999 sailing vessels, of 3,029,226 tons, and 428 steamers, of 257,861 tons, were employed solely as foreign-going ships, employing respectively 109,090 and 17,821 men; 19,209 sailing vessels, of 3,956,038 tons, and 862 steamers, of 369,204 tons, were employed in trading in, from, and to Great Britain and Ireland.

The extraordinary extension of our steam navigation may also be seen from the following official return of steamers built and registered in the United Kingdom since 1848:—

Year.	*Steamers.*	*Tonnage.*
1849	68	12,498
1850	68	14,584
1851	78	22,723
1852	104	30,742
1853	153	48,215
1854	174	64,255
1855	233	81,018
1856	229	57,573
1857	228	52,918

It likewise appears that the number of steamers engaged in the home trade increased from 312, in 1849, to 388 in 1857, and the tonnage from 54,089, to 92,441; the number engaged partly in the home and partly in the foreign trade increased from 20 in 1849 to 66 in 1857, and the tonnage from 5539 to 20,859; and the number engaged in the foreign trade from 82, in 1849, to 445 in 1857, and the tonnage from 48,693 to 268,023. [NAVY, *Suppl.*]

Among the prodigies of modern shipbuilding, the construction of that leviathan steamer of the deep, the *Great Eastern*, is the most wonderful. Her burden is 22,500 tons, and she is built for accommodating 4000 passengers. At the same time she will carry 12,000 tons of coals, and 8000 tons of merchandise. She is presumed to be the strongest ship in existence, being built upon the principle of a hollow iron beam. She is a double ship, complete and perfect, the internal hull being supported by boiler-plate stays three feet deep. The two lower decks serve as bridges or stays, and the main deck is similar to the hull, of a cellular construction. She is 680 feet in length, 83 feet broad, and 58 deep from her deck to the floor of her hull. Her propulsion is by two paddles and a screw. The four engines to propel the paddle-wheels are equal to 1350 horse-power, and the four engines to propel the screw are equal to 1700 horse-power. She has five funnels connected to ten boilers, and six masts for any amount of canvas. Her speed is calculated at 17½ miles an hour, and she will go to Port Phillip in 36 days.

The following is a comparative view of the dimensions and tonnage of five of our greatest steamers, with the dates when they were launched.

	Launched.	*Size.*	*Tonnage.*
Great Western	1838	236 by 35½	1,340
Great Britain	1844	322 by 51	3,443
Himalaya	1853	370 by 43½	3,550
Persia	1856	390 by 45	3,400
Great Eastern	1857	680 by 83	22,500

The *Persia* is unquestionably a magnificent iron paddle steamship, built by the Napiers of Glasgow, for the Cunard Company. Her speed is from 16 to 19 knots an hour. But the American steamer *Vanderbilt*, of 5000 tons, is next in size and importance to the *Great Eastern*. Her length is 335 feet, breadth of beam 46 feet, depth of hold 32½ feet. She carries 1000 tons freight, 1500 tons of coals, and 800 tons of water. Her speed is 14 knots an hour.

SHIPWRECKS. [LIFE-BOATS; LIFE-PRESERVER; MANBY, CAPT., *Suppl.*]

SHIRES (x. 972-4). The old Court Leets and Hundred Courts of Counties may be said to be obsolete since the introduction of County Courts. [COUNTY COURTS, *Suppl.*]

SHODDY, a worsted yarn produced from old woollen rags, tailors' clippings, or old stockings,

which are torn up, fibre by fibre, in a machine technically called 'a devil.' The material is then spun into yarn, with a little fresh wool added thereto, and made into druggets, padding, and other articles of an inferior quality. Its chief manufacture is at Dewsbury, in Yorkshire. Nothing, says the editor of 'Novelties, Inventions, &c., is a 'greater industrial curiosity than the *shoddy* made at some of the Yorkshire mills. The old woollen rags—the last organic remains of coats and trousers—used to be employed for various trifling purposes; but they have now risen in dignity: they have become the elements out of which new coats and trousers will spring. There is here a kind of metempsychosis of garments, which the ancients knew nothing about. Dewsbury draws to itself woollen rags from all parts of Europe; coarse, fine, little worn, much worn, white, coloured, clean, dirty,—all are welcome; they may be so good as to command 50*l.* per ton, or so bad as to be worth less than that number of shillings: they may be clean from Scotland or from Denmark; or dirty from Ireland or from Italy—all are grist to the Dewsbury mills. There they are "devilled," or torn to tatters by the sharp spikes of rapidly-revolving machines. The "devil's dust" rises in stinking clouds, and befouls the whole town in its descent; and the women, while sorting the rags, and the men, while feeding the "devils" with rags, muffle their mouths to ward off the choking effects of the unsavoury dust. Taken altogether, this is, perhaps, the vilest stage in any department of our textile manufactures. Some of the "shoddy," worked up into poor flimsy cloth, is exported to America for slave clothing; but more generally it is mixed up with a greater or less proportion of new wool, and then spun into yarn for coarse goods.'

SHRAPNELL, LIEUT.-GENERAL, was the inventor of the case-shot used by the Royal Artillery, and known by the name of *Shrapnell Shells*. He entered the military service early in life, and received his commission as second lieutenant in the Royal Artillery in 1779. After passing through the different grades of military rank, in 1827 he obtained his position of lieutenant-general. During the early period of the war with republican France, General Shrapnell served with the Duke of York's army in Flanders, and was at the siege of Dunkirk. It was soon afterwards that he made the discovery of his shells, which was considered of such importance, that on its adoption by the service he received a pension of 1200*l.* per annum, in addition to the pay of the respective ranks he subsequently held in the army. He died near Southampton in 1842.

SHROPSHIRE, or SALOP (x. 980–88). According to the census of 1851, the population of the county was 229,341; of which 114,340 were males, and 115,001 females. Of houses, inhabited and uninhabited, there were 47,710. The area of the county was estimated at 826,055 acres, or 1291 square miles, with 178 persons to a square mile. The population of the principal parishes or towns was as follows:—

Bishopscastle	1,961	Bridgnorth mun.	6,172
Bridgnorth parl.	7,610	Oswestry	4,817
Broseley	4,739	Pontesbury	3,363
Church Stretton	1,676	Prees	3,196
Claverly	1,613	Priors Lee	2,574
Cleobury Mortimer	1,738	Shiffnal t.	1,958
Clun	2,121	Shrewsbury	19,681
Condover	1,723	Wellington	4,601
Dawley Magna	9,201	Wem	3,747
Drayton	4,163	Wenlock mun.	18,728
Ellesmere	2,087	——— parl.	20,588
Ercall Magna	1,975	Westbury t.	1,497
Hales Owen t.	2,411	Whitchurch	3,619
Hodnet	2,057	Whittington	1,927
Lilleshall	3,987	Wombridge	2,166
Ludlow mun.	4,691	Worthen	2,887
——— parl.	5,376	Worfield	1,735
Madeley pa.	8,525	Wrockwardine	3,107
Newport	2,906	Wrockwardine Wood t.	2,099

SICCA, in India, a weight for gold and silver, equal to 179¾ gr. troy. The term was formerly very generally applied to the rupee as a money and a weight. The rupee was called a sicca only during the year after its coinage, and afterwards a sonaut rupee. The various siccas are now estimated by the shroffs, or native money-changers, in comparison with the legal current rupee of the East India Company's mint. (Simmonds' *Dictionary of Trade Products.*)

SICILY (x. 1007–10). According to the census of 1851, the population and area of the seven provinces, into which this island is divided, were as follow:—

	Population.	Sq. Miles.
Palermo	514,717	1,984
Messina	349,484	1,336
Catania	379,991	1,761
Girgenti	245,974	1,375
Noto	237,814	1,482
Trapani	182,809	1,353
Caltanisella	180,791	1,190
	2,091,580	10,536

SIDEROSCHIS'OLITE (Gr. σίδηρος steel, σχιστὸς fissile, and λίθος a stone), a mineral of a brilliant lustre, and black colour, with streaky green. It occurs in small six-sided prisms. When exposed to heat it becomes black and magnetic. Its specific gravity is 30; and its hardness = 2·0 to 3·0. Its component parts are protoxide of iron, silica, and alumina.

SIERRA NEVADA. [CALIFORNIA, *Supplt.*]

SILK (xi. 23). The following is a tabular synopsis of our imports of silk, in bales, for the twelve years preceding 1857, with the respective places from which it was exported:—

A.D.	China.	Bengal.	Persia.	Italy.
1845	11,358	12,031	198	5703
1846	20,270	8,835	2210	4182
1847	22,379	7,492	825	3740
1848	23,692	4,924	1389	7439
1849	21,422	10,090	1085	5830

A.D.	China.	Bengal.	Persia.	Italy.
1850	21,008	10,295	4259	3712
1851	23,109	3,811	3020	3200
1852	28,704	11,684	3032	2717
1853	35,563	9,026	5824	4600
1854	60,319	9,345	1678	4306
1855	52,210	8,228	1530	2875
1856	58,551	13,839	1858	2784

The use of SPUN SILK is one of the great advantages attending the manufacture of silk goods in Lancashire and Cheshire, especially at Manchester. It is well known that the best silk goods are manufactured from thrown silk, which is the long continuous thread obtained from the silkworm; but the shorter and waste fibres can only be worked up by processes similar to those of cotton-spinning. These processes Manchester has undertaken to perform; whence a new branch of industry has arisen. There most of our cheap goods, made of spun silk, with an occasional admixture of cotton, are plentifully produced; and we may reasonably expect the application of steam power in silk-weaving in that great hive of manufacturing industry. The results are likely to be important. Already have our modern silk mills produced yarn or silken thread so fine as to give a length of twenty-four miles to a pound weight; and in embroidered goods we find that Houldsworth's machine can figure both sides of a piece of silk precisely alike.

SILPH'IDÆ (Gr. *σίλφη* a grub, one of the genera), a family of Coleopterous insects, distinguished by the antennæ being clavate, and the club perfoliate. (Craig.)

SILVER COINAGE. The silver coinage of Great Britain, intended for general circulation, consists of crowns, half-crowns, florins, shillings, sixpences, fourpennies, and threepennies. But silver is not a legal tender for more than 40*s.* at a time. The Mint value of silver is 5*s.* 6*d.* the ounce. The price of silver bars, standard, was 59⅝*d.* in London, January 1850; reached 62¼*d.* in January 1856; and 62*d.* in January 1858. The silver coined at the British Mint, since 1840, has been as follows:—

1840	£216,414	1850	£129,096
1841	96,175	1851	87,868
1842	192,852	1852	189,597
1843	239,580	1853	701,545
1844	610,632	1854	140,480
1845	647,658	1855	195,511
1846	559,548	1856	462,528
1847	125,730		
1848	35,442	Total	£4,750,248
1849	119,592		

According to a parliamentary return, published in April 1858, it appears that there were no crowns issued in 1857; but of half-crowns the number was 837,845, of the value of 104,730*l.*, the weight of metal used being 880,839,000 ounces. The number of florins was 1,671,120, valued at 167,112*l.*, the weight of metal representing 607,680,000 ounces. Of shillings the number was 2,562,120, the value being 128,106*l.*, the metal employed amounting to 465,840,000 ounces.

SIMO'NIANS, an early Christian sect, founded by Simon Magus, a philosopher and reputed magician, who was held in high estimation by his followers. It is said that he was the first heretic among the Christians; and that among the Samaritans he made himself pass for God the Father, and among the Jews, for the Son.

SINTOOS (Japanese, *sin* faith, and *jo* worship), a sort of idolaters in Japan, who, besides a belief in a Supreme Being, acknowledge several inferior deities, whom they place among the stars, and worship those whom they suppose to have a control over this world. They also believe that their chief friends have descended from, and are the living images of their favourite deities.

SIVATHE'RIUM (*Siva*, a district in India, and also *θηρίον* a wild beast), in geology, an extinct genus of Ruminantia, the remains of which have been found in the tertiary formation of the Sivaleh, a sub-range on the northern side of the Himalaya. Dr. Falconer and Captain Cautley brought to light this extinct animal, which, though classed among the Ruminants, appears to form the intermediate link between the Ruminants and the Pachydermata. The living animal had two pairs of persistent horns cresting a short thick neck, thus resembling an immense antelope or gnu; while the structure of the snout indicated that it was furnished with a trunk.

SIXPENCE, a small English silver coin, the half of a shilling, which weighs 1 dwt. and 19·63 grains. Of the sixpences coined within the last ten years, the following is the official account; there being none struck in 1848:—

1847	586,080	1854	840,116
1849	205,920	1855	1,129,084
1850	498,960	1856	2,779,920
1851	2,288,107		
1852	904,586	Total	13,070,703
1853	3,837,930		

SLATES, and SLATE-QUARRIES (xi. 85). The value of our slate quarries, and the various artistic uses to which the slate is applied, are assuming daily importance. The many remarkable specimens exhibited at the Great Exhibition in Hyde Park attracted public attention, not only from their geological structure, but also from their commercial and manufacturing importance. The collections of slates, from their native beds, as they came from the quarries of Wales and Cornwall, were exhibited outside the building, and the specimens manufactured from the same material were placed inside; from these the public were enabled to judge of the relative values of the raw material, and to what artistic purposes it could be applied. Of the outside specimens, there were slates from Llanberis, and from the Dorothea Slate Company's quarries near Carnarvon. There were also slates from the great quarries at Penrhyn, shipped at Bangor. These quarries have as many as ten levels, and give employment to two thousand persons. There were some from quarries at Festiniog, in Merionethshire; from quarries near Machyllneth, Montgomeryshire; from the Delabole quarries in

Cornwall; and from quarries in Lancashire and Westmoreland.

Such has been the increasing demand for the productions of these quarries, that during the month of May 1858 the quantity of slates exported at Carnarvon and Port Dinorwic was 7723 tons 18 cwt., showing an increase of 555 tons 2 cwt. on the exports for the corresponding period of the previous year. About 500 tons were conveyed by railway from the Carnarvon station, and four-fifths more dispatched overland from Port Dinorwic. The slate slabs are now used in large quantities for useful and ornamental purposes; as the construction of water cisterns and filters; for the covering of roofs for cabinets, larders, baths, and wash-houses; wall linings, floors, drains, balconies, wine cellars, and dairies. The consumption of slates in London is about 40,000 tons per annum. Of this quantity about a third is employed in making slabs, and the rest in roofing. The introduction of finely-polished slates into the fine arts gave an unexpected turn to this department of industry. They have been employed in the manufacture of enamelled and highly-ornamented table-tops, trays, inkstands, finger-plates for doors, and various other ingenious and artificial purposes.

SLIGO, County of, Ireland (xi. 102-6). According to the census of 1851, the entire population was 128,511. Of inhabited houses there were 31,443. The area of the county was 721 square miles, or 461,753 acres, of which three-fourths are arable, or in plantations. The population of the principal places was as follows:—

Ballymote	965	Collooney	568
Ballysadare	5,263	Sligo	13,320

SMARAGDITE (Gr. σμάραγδος a green stone), a mineral of an emerald-green colour, and pearly lustre. It is hardly as hard as glass.

SMITH, HORACE, the novelist, was the son of Robert Smith, solicitor to the Board of Ordnance, and born in 1779. He was originally a member of the Stock Exchange; but having an early predilection for literature, he became one of the early contributors to the 'Pic Nic' newspaper, which was established in 1802, by Colonel Grenville. He also wrote extensively for the 'London Review,' the 'Monthly Mirror,' and the 'New Monthly Magazine.' But the work which established his fame was the 'Rejected Addresses,' which he brought out in conjunction with his brother James, who had also a strong penchant for literature. These 'Addresses' made their appearance in 1812, on the opening of Drury Lane Theatre; and numerous editions have been since sold in rapid succession. Encouraged by his success in literature, Smith soon became an indefatigable writer of novels. He commenced, in 1825, with 'Gaieties and Gravities;' and for a period of twenty years he continued to produce a rapid succession of novels, most of which were very favourably received; such as 'Brambletye House,' 'Tor Hill,' 'Reuben Apsley,' 'Zillah,' 'The New Forest,' 'Adam Brown,' 'Love and Mesmerism,' &c. He died in 1849.

SMITH, REV. DR. JOHN PYE, an eminent nonconformist divine, and principal of the Independent College at Homerton, was born at Shefield, in 1774. During the early part of his life he was engaged in tuition with considerable success; and afterwards entered largely into the field of theological literature. His controversial works are distinguished throughout by a spirit of Christian candour; and also for lucidity and elegance of style. He was the author of several works on the divinity of Christ, and on the harmony of geology with revealed religion; 'Scripture Testimony to the Messiah,' which went through several editions; 'Principles of Interpretation,' as applied to the Prophecies of Holy Scripture;' and various sermons and addresses which had reference to the vital truths of Christianity. In 1850 he retired from the presidency of Homerton College, owing to the declining state of his health, when a sum of 3000*l.* was subscribed, to provide him an annuity for the remainder of his life. But he did not live long to enjoy it. He died in February 1851; and the interest of that sum is now applied to the endowment of divinity scholarships, in the New College, St. John's Wood, which bear his name.

SMITH, ADMIRAL SIR WM. SIDNEY, was the third son of Captain J. Spencer Smith, of Midham, in Sussex, who served during the 'Seven Years' War,' and was aide-de-camp to Lord George Sackville at the battle of Minden. Sir Sidney was born in Park Lane, Westminster, in 1765, and at twelve years of age was sent as a midshipman on board the *Sandwich*, under Lord Rodney. At sixteen he was made a lieutenant in the *Alcide* 74, and at nineteen a post-captain. Hostilities breaking out between Russia and Sweden, he obtained permission to serve under the latter power, and was present at the engagement between the Prince of Nassau and the Duke of Sudermania. For his bravery in that action he was honoured with the order of the Sword; and his own sovereign approving of the acceptance, he ever afterwards received the title of Sir Sidney Smith. On the breaking out of the war with France, he was soon engaged in hostilities with that power. He was present with Lord Hood at Toulon; and the destruction of the ships of war, which could not be carried off, was entrusted to him. He was next appointed to the command of the *Diamond* frigate; and with a small flotilla under his command did considerable mischief to the enemy. But in an attempt to cut out a ship at Havre de Grace, he was taken prisoner, and confined for two years at Toulon; from whence he escaped by the aid of a French officer. In 1798 he sailed in the *Tiger*, of 80 guns, for the Mediterranean. He arrived at Constantinople, and then sailed with a small squadron to Europe. Bonaparte having marched to Syria, Sir Sydney repaired to Acre, and by his astonishing exertions preserved the place. Bonaparte having quitted Egypt, Sir Sydney negotiated with General Kleber for the evacuation of the country, and by a treaty, signed at Al Arisch, that desirable event was agreed to; but Sir Sydney's superiors would not ratify the treaty, and it cost our army thousands of men to drive the enemy out. At the

general election, in 1802, he was returned to Parliament as one of the representatives of the city of Rochester.

On the breaking out of the second French war, in 1802, Sir Sidney was appointed to the *Antelope* 50; and in 1804 was made colonel of marines. He had a flying squadron under his command, which was very effectually engaged in intercepting the French flotillas, and protecting the British Channel coast. In 1805 he was raised to the rank of Rear-Admiral of the Blue; and in the following year he hoisted his flag on board the *Pompey*, of 80 guns, in which he proceeded to the Mediterranean. When Sir Sydney reached that station, Lord Collingwood gave him the command of a small squadron intended to harass the French in the kingdom of Naples, which they had recently conquered. With this force he compelled the island of Capri to surrender, and severely annoyed the enemy. In 1807, when it was supposed that the Prince Regent of Portugal would be compelled to act hostilely against Great Britain, Sir Sydney was employed to blockade the Tagus; but, on the Prince resolving to remove, with the Court, to the Brazils, the British Admiral despatched four sail of the line to accompany the Portuguese fleet.

In 1810 Sir Sydney Smith was promoted to the rank of Vice-Admiral, and in 1812 appointed second in command in the Mediterranean. When the Prince Regent increased the number of the order of the Bath, Sir Sydney was appointed one of the Knights Commanders. He also received for his services a pension of 1000*l.* a year. In 1821 he attained the rank of Admiral, and was appointed Lieutenant-General of Marines on the 28th June 1830. He died in May 1841.

SMITH'SONITE (so named in honour of Mr. *Smithson*), a mineral of a variety of colours, with a vitreous lustre, and translucent. It is brittle, and hard enough to scratch fluor-spar. Its specific gravity is 3·38; and its constituents, oxide of zinc and silica.

SMYTH, WILLIAM, Professor of Natural History in the University of Cambridge, was born in 1764. After passing through the regular routine of a liberal education, he entered the University, where he was destined, in 1807, to become the Professor of Natural History, in which high position he distinguished himself by his great learning and talents, during the long period of forty-two years. He established his fame by the production of various publications of standard reputation in the republic of letters. Among others, he brought out 'Lectures on Modern History,' 'Evidences of Christianity,' and 'Lectures on the French Revolution.' He was also the author of a volume of poetry, entitled 'English Lyrics,' which were first published in 1806. He died in 1849.

SNOW-LINE. [MOUNTAINS, *Supplt.*]

SOCIAL ECONOMY is the science of promoting the general amelioration of the community, and contributing to the happiness and well-being of society at large. The 'National Association for the Promotion of Social Science,' incorporated at Liverpool in 1858, have chosen SOCIAL ECONOMY as one of their leading subjects; on which, at one of their early meetings the Right Hon. Sir James Stephen delivered the opening lecture. Thus the question is beginning to assume some importance in the social system.

The science of Social Economy may be treated under three different aspects,—the *physical*, the *moral*, and the *educational*. The first embraces all that is requisite for animal existence, or conducive to human comfort; the *moral* comprehends everything that is calculated to exalt the feelings of man beyond the ordinary level of the savage, or of 'the beast that perisheth;' and *educational* amelioration is that which is intended to elevate the mind, and expand the understanding, by imparting to the rising generation the advantages of learning and the blessings of religion. In the attainment of these great objects there are various considerations which it behoves the statesman and ethician seriously to consider, because, in the altered and ever-changing aspect of society, there are many things to be done which have been left undone, and many things to undo which have already been done. It would be in vain, for instance, to attempt the promotion of universal education, while the people were wanting food and raiment, or were in a state of social demoralization from those necessaries not being duly distributed. The *first* duty of society is to see that there is abundance of food, and a sufficiency of the leading necessaries of life, for all; the *second* is to provide for their distribution; which can only be done by affording universal employment to the people, and 'a fair day's pay for a fair day's work.' The *third* duty, which ought to be the most delightful to the philosopher, the philanthropist, the ethician, the theologian, and the statesman, is that of establishing a system of universal education, by which men may be taught the blessings of intellectual enjoyment in this world, and the hope of eternal happiness in the next. These great principles, abstractedly considered, appear so self-evident, that the wonder is, that they should evoke a difference of opinion. But, unfortunately for the happiness and well-being of mankind, there have been so many conflicting interests engaged in these important questions, and they have been so mixed up with party politics, that scarcely any two writers, though possessing equal learning and judgment, could ever arrive at the same conclusions. In illustration of this, we have only to refer to the various contradictory enactments and conflicting opinions that have been recorded, as regards the great social questions of Population and Food,—Capital, Labour, and Wages,—Wealth and Luxury,—Poverty and Crime,—Deficiency, Excess, and Distribution,—Steam, Machinery, and the Railways,—the Monetary System,—Education and Religion,—Legislation and Jurisprudence.

In the discussion of these various topics, at different periods of our social history, the whole empire has often been aroused and set in commotion; and those principles which have prevailed at one time, as being expedient and just, have been condemned and abrogated at another, as being impolitic and unrighteous. Unhappily for the interests of the community, the late corn and tariff

laws, which had become unadapted to our ever-augmenting population, were treated, not as *social* but as mere *party* questions,—a contest between Whigs and Tories,—a struggle between the predial and the cotton lords, during which the community at large was the mere board on which political gamblers played their cards. The spirit of party, however, having, by the course of events, been softened down into more sober reasoning, and experience having at length afforded us juster views of the true bearings of these important questions, we are enabled to enter upon them with calmer and more dispassionate feelings. But yet we must bear in mind that steam, machinery, and railways, have already effected great changes in society, and are likely to bring about still further modifications. In fact, they form an agency in the social system that will require the guiding hands of the statesman and the interference of legislative wisdom, to direct and control; or otherwise the most precious boon which science and art have conferred on man from the days of the creation, may be converted into a curse instead of a blessing.

Among the more important elements of our social polity, Population, Labour, and Food must be especially noticed. The enormous increase of our population within the last few years, and the certainty of augmentation in a still greater degree during the next twenty, is deserving of serious consideration. Whether that population is to contribute to the national strength, or be productive of social misery, depends on various circumstances, but chiefly on the government and the legislature of the country.

As a general principle in Social Economy, it may be safely enunciated, that, next to a bountiful supply of food, useful labour is indispensable, for the purpose of distributing that food, as well as other comforts and necessaries, among all classes of the community. [DISTRIBUTION, *Suppl.*]

If we revert to the past, we find that our early ancestors were always labouring under the impression that an increase of population would lead to a deficiency of food and a want of employment; and so ignorant were they of the blessings of a free commercial intercourse between different nations, that we hear of repeated instances of famine at a time when the population was not one-fourth of our present number, and when we produced more grain than our consumption required. This fact demonstrates how imperfectly the theory of population and food has been understood.

In the reign of Elizabeth the population did not amount to one-third the proportion of the present period; yet we find complaints existing of the alarming increase of town population, and of some stringent measures being devised to check it, lest the nation should be subject to a recurrence of those periodical famines to which it had been occasionally exposed. Since that period our population has proceeded at the rate of about one and a half per cent. yearly, and yet we have never suffered from those famines of which we read in history, when the inhabitants were few, and provisions scanty. The solution of this problem is to be found in the unproductiveness of even the fairest tracts so long as they remain in a state of nature. Whatever be the serenity of the climate, or the richness of the soil, they remain unavailing to any useful purpose without the application of labour and art. By these alone can the forest be cleared, the heath manured, and the land duly irrigated. It is to the achievement of tasks like these, the most acceptable of any in an early age, that we trace the honours so liberally bestowed in ancient mythology, the apotheosis of the hero who drained the Lernæan fens, and destroyed the savage occupants of the woods. But there is no necessity to demonstrate these facts by reference to the heroic ages. We have only to look to the times in which we live, and to a portion of the world peopled by our own race—the western States of America, and the extensive regions of Upper Canada,—to illustrate the all-important truth, that by labour and art the produce of the earth may become infinitely more abundant than the domestic demand. We there find that our transatlantic compatriots, with their vastly-increasing population, have not only produced sufficient for domestic consumption, but have been enabled to supply the urgent demands of all Europe.

Thus we find that population, instead of pauperizing a country, as the Rev. Mr. Malthus contended, may constitute her strength and happiness. This great principle is fully demonstrated in the history of the most populous of the modern States of Europe. In fact, all general apophthegms as to food and population must be received with extreme caution; for we have had strange doctrines broached at various times, not only by Malthus, but by men of the highest station and influence. The celebrated and pious Judge Hale, taking for granted that the food of a country was limited by physical causes, declared gravely from the judicial bench, that 'the more populous we were the poorer we became;' and we have still such daily evidence of the contradictory and conflicting opinions of the leading politicians of the day on the subject of population and food, as to warrant us in affirming that no fixed principles in social economy have yet been established, to which the universal voice of mankind has assented.

If difficulties have hitherto existed in the minds of the most distinguished statesmen, when the relations of society were much more simple and less complicated than at present, what ought we to think, when we take into consideration the social complexities which steam, machinery, and railways are calculated to superinduce? Here we have no parallel in the annals of the world. They may conduce to national greatness or social ruin. That a numerous population will follow in their train there can be no doubt. Whether that population is to conduce to weal or woe will depend on a thousand contingent circumstances. No doubt we are destined to undergo great social changes. The powers of mechanical production are almost infinite; and from the general disposition among mankind for national peace,—the spirit of sanatory improvement,—and the discovery of vaccination, which alone has added three years to the average of man's life,—we can no longer rely with safety on the statistics of past

ages. Under the present aspect of society, population must necessarily continue to increase beyond all former precedent; which, if wisely directed and controlled, may constitute the strength and glory of the empire; but if left without due provision for the ever-increasing wants of society, the whole community may be eventually involved in one desolating scene of anarchy, of which we have had the most melancholy evidences in the sister kingdom.

Colonization and Emigration are also two important elements in Social Economy. [EMIGRATION, *Supplt.*] 'The current of conquest and of colonization,' says Sir James Stephen in his introductory lecture at Liverpool, 'has been continually flowing on, until at length the trans-oceanic dependencies of this kingdom have come to comprise one-seventh both of the population and of the terrestrial surface of the globe; while this central seat of empire, attracting and attracted by her colonial satellites, imparts to them all her religion, her laws, her language, her literature, and her civil franchises, and especially that pre-eminent franchise of self-government, the very life-spring and cementing principle of the entire system.'

SOCIAL SCIENCE is that branch of knowledge which treats of the good government, morals, occupations, and general well-being of society, of which SOCIAL ECONOMY is one of the principal divisions (*see ante*). In truth, 'Social Science' is but a new name for all the most practically-important and utterly-unsolved questions which are ever exercising the minds of men. It comprehends a vast variety of subjects, intimately connected with all the varied phases of ethical philosophy and political economy. One of the principal objects of the 'National Association for the Promotion of Social Science,' established in October 1858, under the auspices of Lords Brougham, Russell, Shaftesbury, and Carlisle, was to investigate and solve the intricate problems which the science embraces. The questions proposed by the Association are all of the highest importance to our social existence; and every fact that can be adduced, tending to elucidate any one of these, must be a public benefit. Thus Lord John Russell, in his inaugural address, unfolds the leading objects of the Association. 'It is for us,' says he, 'to endeavour to improve the laws by which the community is governed. It is for us to show how education may be extended and diffused. It is for us to examine and record what has been done for the reformation and punishment of offenders. It is for us to confirm and animate the efforts which are being made to sustain the public health, and thereby preserve for this country her eminence as the home of a vigorous and independent race. It is for us to investigate the conditions of the great problems of political economy, which may often admit of exceptions, but never of refutations.'

To these explanations of the great objects of Social Science, may be appended the remarks of the distinguished President of the Association, Lord Brougham. 'The people,' his lordship observes, 'must themselves work out their own improvement. There is no royal road either to popular happiness or to popular fame. Whether people are in pursuit of distinction or of comfort, or of happiness and enjoyment higher than comfort, there is but one road to the fulfilment of their wishes, and that is hard work, sobriety, avoiding excess of all sorts,—no overworking, but no idleness, no intemperance,—and economy and frugality in the management of their resources.' [SOCIAL ECONOMY; REFORMATORIES, &c., *Supplt.*]

SOCIALISM, the doctrine of communism, or living in general community of goods. It was taught by Robert Owen, formerly of Lanark, in Scotland, who proposed to re-organize society by banishing individual motives of action, and establishing the social edifice on his own views of co-operation and mutual usefulness. [OWEN, ROBERT, *Supplt.*]

SOCIETIES, ASSOCIATIONS (xi. 143). The Friendly Societies of England are one of the prominent advantages of our social polity, and present a magnificent spectacle to the world. No less a sum than 1,000,000*l.* per annum is expended by the registered societies in England and Wales for affording relief in sickness alone. The total number of their members is 2,000,000; and the agregate amount of their funds is about 9,000,000*l.* sterling, of which 1,431,543*l.* is in English and Welsh savings banks, and 1,994,991*l.* is invested with the Commissioners for the Reduction of the National Debt. There are several large bodies called 'orders,' which are colossal in their proportions; as the Manchester Unity of Odd Fellows, which consists of 276,254 members; the Ancient Order of Foresters, of 135,000 members; and the Grand United Order of Odd Fellows, of 37,000 members. If we add to these the number of members of minor societies, including those registered and those not, we should find that the sum total would not be much less than 3,000,000.

SOLAR SYSTEM (ix. 166, and PLANETS, *Supplt.*).

SOLASTE'RIA, a sub-family of *Asteriadæ*, or Star-fishes, which includes two British genera, the *Solaster* and the *Cribella*.

SOLDIERS (xi. 168). According to official returns it appears that in the three years 1856-58, 602 officers and 12,441 men have been provided with quarters by new barracks, exclusive of the Royal Hospital at Netley, which accommodates 1000 patients. The total amount of money expended on new barracks, in the twenty years ending April 1856, was 1,432,196*l.*; and the accommodation provided was for 391 officers and 11,237 men. This is exclusive of 722,174*l.* expended in 1854, 1855, and 1856, for hutting accommodation for 2100 officers and 40,296 men. During the last three years 26,801*l.* have been expended for supplying water to barracks, 18,537*l.* for improving the drainage, 1177*l.* on ventilation, 13,126*l.* for sanitary purposes connected with barracks and hospitals, and 120,000*l.* for improvements to existing barracks, including provision of quarters for married sergeants and men.

SOMERSETSHIRE (xi. 187-96). According to the census of 1851, the population of the

county was 643,916; of which 211,045 were males, and 232,871 females. Of houses, inhabited and uninhabited, there were 89,966. The area of the county was 1,047,220 acres, or 1636 square miles; with 271 persons to a square mile. The population of the principal parishes and towns was as follows:—

Banwell. . .	1,878	Milverton . .	2,146
Bath . bor.	54,240	Minehead . .	1,542
Batheaston. .	1,795	Moorlinch . .	2,439
Bedminster bor.	19,424	Nailsea . . .	2,543
Bishop's-Hull .	1,677	North Curry .	1,856
Bridgwater bor.	10,317	North Pether-	
Bruton . . .	1,885	ton . . .	3,815
Burnham . .	1,701	Paulton . . .	2,104
Castle-Carey .	1,860	Pitminster . .	1,607
Chard . . .	2,291	Radstock . .	1,792
Chew-Magna .	2,141	Shepton-Mallet	3,835
Cheddar . .	2,185	Somerton . .	2,140
Clevedon . .	1,905	South Pether-	
Crewkerne . .	3,303	ton . . .	2,165
Curry-Revell .	1,687	St. Decumans .	2,783
Frome . . .	10,148	Street . . .	1,647
Glastonbury .	3,125	Taunton. bor.	14,176
Huntspill . .	1,594	Twerton. . .	2,958
Ilminster . .	3,209	Wedmore . .	3,905
Keynsham . .	2,318	Wellington . .	3,926
Kilmersdon .	2,196	Wells . bor.	4,736
Kingsbury . .	1,856	Weston . . .	3,088
Long Ashton .	1,921	Weston-super-	
Martock . .	3,154	Mare . . .	4,034
Mells . . .	1,861	Wincanton . .	2,488
Merriott . .	1,439	Wiveliscombe .	2,861
Milborne-Port .	1,746	Wrington . .	1,620
Midsummer-Nor-		Yatton . . .	2,061
ton . . .	3,799	Yeovil . . .	5,985

SONTAG, MADAME, the celebrated vocalist and operatic actress, was born at Coblentz, in 1805. Her genius for the stage appears to have been precocious; for at the early age of six she was brought out, at Darmstadt, as Salome, in the 'Donauweibchen' of Kauer, when her infantine talents excited a great sensation. On the death of her father, which took place in her ninth year, she was placed in the Conservatory of Prague, where she was made an excellent musician. On leaving this establishment she proceeded to Vienna, and there made her appearance alternately in German and Italian opera. It is evident that her talents were held in high estimation; for in 1823 she was selected by Weber, then in the height of his popularity, to sustain the principal character in his 'Euryanthe.' The following year she was chosen by Beethoven as solo suprano for his choral symphony and 'Missa Solennis.' She soon received the most magnificent offers at Berlin, Paris, and London, where the salaries paid to her were almost fabulous. After realizing a splendid fortune she entered into the matrimonial state with Count Rossi, and was presented with a fictitious escutcheon and ancestry by the King of Prussia, in order to render her eligible for the highest society of the Continent. She then retired from professional life, though her singing was occasionally heard of in the court-circles of Prussia and Russia. In 1848, however, after about twenty years' absence, the Countess Rossi again made her appearance on the stage; the revolutionary movements of that period, and the assassination of her husband, having reduced her to that necessity. She was again received in London with great *éclat*, and sustained, with her accustomed talent, many of the most difficult parts of the opera. In the 'Figlia' of Donizetti, the 'Prodigo' of Auber, Miranda in 'La Tempeste,' and other parts, she was inimitable. She afterwards proceeded to America, and in 1852 sang at New York, where she met with so favourable a reception, that she was encouraged to form a travelling operatic company of her own, with which she successfully visited nearly all the principal towns of the United States. While at New Orleans she entered into an engagement with the director of the principal theatre of the city of Mexico, to play in opera, for a fixed period, at a salary of 7000 dollars a month. It was arranged that she should appear in Mexico in the opera of 'Lucrezia Borgia;' but unfortunately she was seized with an attack of the cholera, which terminated fatally on the 17th of June, 1854.

SOPHIA, a city of Bulgaria, with about 10,000 inhabitants, the chief portion of whom are Christians. It is a place of considerable commerce; but the chief historic interest attached to it is the circumstance of its having been founded by the Emperor Justinian on the site of the ancient Sardica, which is famous for the Councils held there in the fourth century.

SORDAWA'LITE (from *Sordawala*, in Switzerland, where it occurs), a mineral of a vitreous lustre and conchoidal fracture. It occurs in bluish-black, or greyish masses, which do not exhibit any traces of cleavage. Its specific gravity is 2·53 to 2·58; hardness = 2·5 to 3·0; component parts—silica, peroxide of iron, alumina, magnesia, and phosphoric acid.

SOULT, MARSHAL, one of the most distinguished of Bonaparte's generals, was born in 1796, the natal year of the Duke of Wellington, and of his own illustrious chief. Before the breaking out of the great revolution he marched as a private soldier under the standard of the French armies, and eventually became the first-lieutenant of the Emperor Napoleon. His military career was a most eventful one; but the details are more matter of history than of biography. He took an active and brilliant part in the most memorable campaigns of the Revolution and the Empire. But he was not merely a great captain; he was a worthy citizen, a judicious administrator, and a distinguished statesman. On the termination of the war he continued to devote his genius to the service of his country as an administrator in the re-organization of the army under critical circumstances. As president of the council of ministers, at different times, he was one of the most intelligent and most devoted supporters of the constitutional throne of France. In 1838, he was sent to England, to be present at the coronation of Queen Victoria, as the representative of France. He was then entertained by his

great antagonist, the Duke of Wellington. In September 1847 the illustrious marshal wrote to King Louis Philippe, begging him to accept his resignation of the functions of president of the council. In this office he was replaced by M. Guizot. But the king, wishing to give him a striking testimony of his gratitude, re-established for him the ancient dignity of marshal-general. When the revolution of February 1848 had broken down the throne which he had so nobly served, the marshal confined himself strictly to private life, and refused to contract any engagement with the new powers that succeeded. He died in 1852, aged 82.

SOUTH AUSTRALIA. [AUSTRALIA, *Suppl.*]

SOUTHEY, CAROLINE-ANNE, widow of the poet-laureate, Dr. Southey, was the daughter of Charles Bowles, Esq., and born in 1786. She is most generally known, in the republic of letters, by the name of Caroline Bowles. In early life she distinguished herself by her literary tastes; and first formed an acquaintance with Dr. Southey, by sending him her poem of 'Ellen Fitzarthur,' of which he returned a favourable opinion. This little incident produced an intimacy, which, after the death of Southey's first wife, eventually led to their marriage, in 1839. Her productions were chiefly poetical, and from time to time she collected them into volumes. But a work in prose, entitled 'Chapters on Churchyards,' which originally appeared in 'Blackwood's Magazine,' contributed materially to establish her reputation; and showed that she possessed all the requisites of novel-writing, had she chosen to devote her talents to that department of literature. Her different works may be thus enumerated, in the order of time in which they made their appearance: — Ellen Fitzarthur, 1820; The Widow's Tale, 1822; Solitary Hours, 1826; Chapters on Churchyards, 1829; The Birth-day, 1836; The Life of Andrew Bell, 1844; Tales of the Factories; and in 1847 appeared a fragment, entitled 'Robin Hood, by the late Robert Southey and Caroline Bowles, with other Poems.' In consideration of her late husband's, as well as her own literary merits, the Queen conferred on her a pension of 200*l.* a year, which she continued to enjoy to the time of her death. She died in July 1854.

SOVEREIGN BALANCE, an ingenious instrument for ascertaining the legitimate weight of sovereigns and half-sovereigns. In 1842, when the bank regulations respecting 'light gold' came into operation, many attempts were made to produce an instrument which should readily determine whether a gold coin was the proper weight prescribed by authority. Among others, was Kershaw's 'Micrometer Sovereign Balance,' which was duly registered at the time. This ingenious little machine has been thus described by the author of 'Novelties and Inventions.' It chiefly consists, says the writer, 'of a beam or steelyard placed horizontally, and supported on a knife-edged fulcrum near its centre. Near one end of the beam a few threads of a screw are cut, upon which a micrometer wheel turns freely. The rim of this wheel is divided into degrees, which mark half-grains in weight. The coin to be weighed is placed upon the other end of the beam, and if it be of correct weight, an index-bar comes exactly opposite the zero or 0 point of the micrometer; but if the weight be deficient, the micrometer wheel is turned round (by which the leverage power of the beam is slightly modified) until equilibrium is obtained; the degree at which the index-bar now points indicates how many half-grains the sovereign is deficient in weight. The machine is not intended to determine the weight of a sovereign, but the deficiency of weight in a light sovereign. By a little adjustment it is made applicable to half-sovereigns.'

SOVEREIGNS. [MONEY, viii. 647.] The following is a return of the amounts coined in this country during the ten years from 1847 to 1856 inclusive:—

1847	£4,667,127	1853	10,597,993
1848	2,246,702	1854	3,589,611
1849	1,755,399	1855	8,448,482
1850	1,402,039	1856	4,806,160
1851	4,013,624		
1852	8,053,435	Total	49,580,572

SOWERBY, GEO. BRETTINGHAM, F.L.S., the eminent naturalist, was born at Lambeth, in 1788. He was of a family distinguished as naturalists and natural history artists, especially in connection with conchology, botany, and entomology,—being the second son of James Sowerby, and brother of Charles Edward Sowerby, who died in 1842. His papers on the Mollusca, about forty in number, are still held in much repute. They were printed in Agassiz's and Strickland's 'Bibliography of Zoology,' published by the Ray Society; and have also appeared in the 'Zoological Journal,' the 'Reports of the British Association,' and other works. Mr. Sowerby was the purchaser of the celebrated Tankerville collection of shells, of which he published an account in 1830, under the title of 'Species Conchyliorum.' He also published a work of considerable importance, entitled 'The Genera of Recent and Fossil Shells,' which was brought out from 1820 to 1824. In 1842 appeared his 'Thesaurus Conchyliorum, or Figures and Descriptions of Shells', which, from his accurate and extensive knowledge of the forms of shells, is still considered as one of our principal text-books in conchological lore. He died in July 1854.

SPAIN (xi. 239-65). Since the events of 1846 (p. 255) Spain has undergone little change, either politically or socially; but the spirit of revolt against the despotism of the government, and the oppressions of the clergy, has occasionally manifested itself. Early in 1855 an insurrectionary movement broke out in Barcelona and other places, and the whole kingdom was declared to be in a state of siege. In July of the same year, an insurrection broke out in Madrid, when, after a sharp contest, the government troops gave up the contest; the Ministry fled, and a National Junta was formed. A constitutional government was established; General Espartero was recalled to power; and the queen-mother,

who had been the principal cause of the outbreak, was banished from the kingdom. In 1856 a revolutionary struggle again took place, when General O'Donnell was appointed dictator; and he succeeded, by force of arms, in putting down all opposition. Since then, there has been apparent tranquillity throughout the kingdom; but it is generally believed to be only the prelude to a coming storm.

SPECIES OF PLANTS [BOTANY, iii. 651–61, and *Supplt.*; VEGETABLES and VEGETATION, xii. 540–3].

SPHÆRULA'CEÆ (Gr. *σφαῖρα* a sphere), a family of Foramenifera, which, according to Blainville, comprises the different genera *Miliola, Melenia, Saracenaria,* and *Textularia.* According to Lamarck, the Sphærulaceæ comprehend the fourth family of Cephalopoda.

SPHÆ'RULITE (Gr. *σφαῖρα* a sphere, and *λίθος* a stone), a mineral of various shades of colour, which occurs in spheroidal masses, with a conchoidal fracture. Its specific gravity is 2·4 to 2·54; hardness=7 to 7·5; constituents—silica, alumina, potash, soda, magnesia, and oxide of iron.—*Sphærulite* is also applied to a genus of Mollusca, belonging to the *Rudista* of Lamarck, of the family Ostracea.

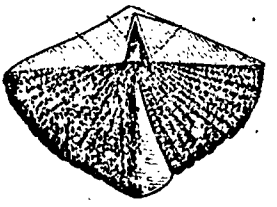
[The Greek word *Sphaira* (anything globular or round) is of frequent occurrence in the formation of scientific terms; as *Sphæreda,* a fossil plant, from the coal formation of the Yorkshire coast;—*Sphæria,* a genus of fungi, of the tribe Gasteromycetes;—*Sphærioductylus* (round-fingered), a genus of lizards, of the family Iguanidæ;—*Sphærocera* (round-horned), a genus of Dipterous insects, of the family Muscidæ;—*Sphæronites,* a genus of fossil Echinodermata, found in the Devonian and Silurian formations;—*Sphærophysa* (round-bladdered), a genus of leguminous plants, of the sub-order Papilionaceæ;—*Sphærotheca* (round-sheathed), a genus of plants, of the order Scrophulariaceæ;—with numerous other terms in botany, zoology, &c., which our limits do not allow us to enumerate.]

SPHENE (Gr. *σφήν* a wedge), a mineral found interspersed in the primary rocks, of various shades of colour, and of vitreous lustre. It is of a polished texture; and its constituents, according to Klaproth, are silicic and titanic acids, and lime; with a specific gravity of 3·46.

SPINEL (Fr. *spinelle* pale red), a mineral, with a flat, conchoidal fracture, and of vitreous lustre. It is a species of ruby, and exhibits a variety of red or violet-tinted shades. Its specific gravity is 3·5; its hardness=8·0; and its constituents—alumina, silica, magnesia, protoxide of iron, and lime.

SPINEL'LANO, a mineral of an ash-grey colour, which, in its crystalline form, is usually the rhomboidal dodecahedron. Its specific gravity is 2·28; and its constituents—silica, alumina, soda, lime, oxide of iron, and sulphuric acid.

SPIRIFER (Lat. *spiro* to breathe, and *fero* to bear), in geology, a very pretty genus of Palliobranchite Mollusca, found in the Palæozoic strata; but it is now extinct. It is characterized by the shell having two internal calcareous spiral appendages. There are various species, some of which are very beautiful; as the *Spirifer Hystericus,* which Professor Ansted classifies among his group of Carboniferous fossils.



SPIRIFER HYSTERICUS.

SPIRITS. According to the official returns for 1855, there were distilled, in the whole of the United Kingdom, 27,485,193 gallons of spirits, against 25,003,912 gallons in 1854; 26,441,557 gallons in 1853; 24,423,202 gallons in 1852; 24,543,657 gallons in 1851; and 25,844,887 gallons in 1850. Of this enormous quantity 7,921,983 gallons were distilled in England; 11,283,636 gallons in Scotland; and 8,279,574 gallons in Ireland. The total quantity of foreign and colonial spirits entered for home consumption in the United Kingdom, for 1855, amounted to 4,788,687 gallons; of which 4,457,455 entered England; 192,148 entered Scotland; and 139,084 entered Ireland.

The returns for 1857 show that 32,231,455 gallons of proof spirits were distilled in the United Kingdom—viz. 8,858,186 gallons in England, 13,299,409 in Scotland, and 10,073,860 in Ireland. Duty was paid on 24,150,433 gallons for consumption in the whole of the United Kingdom, the amount of duty yielded to the revenue having been 9,025,835*l.*

SPRINGS, INFLAMMABLE. These springs have existed from the earliest periods, and more especially in the regions of the East. They arise from a combination of hydrogen gas with combustible substances, such as naphtha, pitch, bitumen, rock oil, or petroleum. These substances, of which naphtha is the purest, are usually found exuding from the earth in connection with their waters, as fully described by Herodotus, Pliny, and other writers, both ancient and modern. [NAPHTHA, *Supplt.*]

The great region of these inflammable or naphtha springs, is in the territory of Baku, on the west of the Caspian. In some places, wherever a hole is bored, the inflammable liquid substance rushes spontaneously through the surface. Colonel Rottiers states that this substance 'appears to undergo distillation as it ascends to the surface, and thence falls down the sides of the mountains into reservoirs, constructed at some unknown period. It is conjectured that entire forests of resinous trees were once engulfed by some violent effort of nature, and that their decomposition is the origin of this inflammable liquid. The colour of the oil is black, but it shines with a reddish tint when the sun's rays are upon it.' The Colonel then observes that not far from the same spot he observed an inflam-

mable spring, or current of light-coloured oil, which freely burnt on the surface of water.

In the Birman empire, in Sicily, and the territories of Modena and Parma, there are inflammable springs, consisting of petroleum,—a substance which in its purest state is naphtha, converted into petroleum by a certain exposure to the air. It is related that in one locality of the Birman empire there are 500 wells, or springs, which yield about 400,000 hogsheads of this inflammable substance every year.

SPUN-SILK. [SILK, *Supplt.*]

STAFFORDSHIRE (xi. 347–57). According to the census of 1851, the population of the county was 608,716, of which 310,032 were males, and 298,684 females. Of houses, inhabited and uninhabited, there were 120,941. The area of the county was 728,468 acres, or 1138 square miles, with 535 persons to each square mile. The population of the principal places was as follows:—

Allstonefield	4,523	Penkhull	9,207
Amblecoat	2,053	Penkridge	2,663
Audley	5,180	Rowley Regis	14,249
Biddulph	2,683	Rugeley	3,054
Bilston	23,527	RushtonGrange	1,901
Brewood	3,565	Sedgley	29,447
Brieryhurst	2,276	Shelton	14,796
Burslem	15,954	Shenstone	2,043
Burton-on-Trent	7,934	Smithwick	8,379
Cannock	2,099	Stafford	11,829
Castle Church	2,315	Stoke-upon-Trent	84,027
Cheadle	2,728	Stone	3,443
Checkley	2,271	Talk-o'-th'-Hill	1,973
Colwich	2,072	Tamworth mun.	4,059
Darlaston	10,590	——— parl.	8,655
Fenton-Culvert	4,483	Tettenhall	3,396
Gnosall	2,673	Tipton	24,872
Handsworth, with Soho	7,047	Trentham	2,747
Hanbury	2,535	Tunstall	9,566
Hanley	10,573	Walsall	25,680
Harbprne	2,350	Walsall Wood and Shelfield	1,946
Kinfare	2,872	Wednesbury	11,914
Kingswinford	27,301	West Bromwich	34,591
Knutton	1,918	Willenhall	11,931
Leek	8,877	Wolverhampton mun.	49,985
Lichfield	7,012	———parl.	119,748
Longton	15,149	Wombourne	2,007
Newcastle-under-Lyme	10,569	Uttoxeter	3,468

The Borough of Stoke-upon-Trent comprises the townships of Burslem, Tunstall, Hanley, Stretton, Longton, and Lane-End.

STALEYBRIDGE. [LANCASHIRE, *Supplt.*]

STAMPS, and STAMP DUTIES (xi. 368–70). From 1850 to 1854, many alterations and reductions were made in the stamp duties, which appear to have had a tendency rather to increase than decrease the revenue. Thus in the year ending January 5, 1850, the stamp duties amounted to 6,367,548*l.*, and in 1852 to 6,761,634*l.*; while in the year ending March 31, 1858, they realized the sum of 7,372,209*l.*

During the session of 1853 several amendments and reductions were made in the law regulating the amount of stamps on indentures and covenants for clerks, apprentices, and others. Where no money is paid, they are now fixed at 2*s.* 6*d.*; policies of insurance at 6*d.* on every 50*l.* to 500*l.*; 1*s.* for every additional 100*l.*, and so on; debentures or certificates for bounties or drawbacks at 1*s.*, if not exceeding 10*l.*; 2*s.* 6*d.* above 10*l.* and not exceeding 50*l.*; and 5*s.* above 50*l.* On the 10th of Oct. 1853, the new law, which had been passed the previous session, for the regulation of stamps on money receipts, came into operation, by which it was enacted that all persons receiving money are compelled to give a receipt-stamp (value 1*d.*) for 2*l.*; and for all sums uniformly above that amount; the stamp to be either impressed or affixed, and to be cancelled by the signature. The neglect or refusal to give such a stamp with a receipt subjects the recipient of the money to a penalty of 10*l.*

The compulsory stamp duty on newspapers is abolished, but the proprietors have the option of printing a given number of papers with a penny stamp, when they are intended to pass postage free. Otherwise a penny-postage stamp must be affixed. [NEWSPAPERS, *Supplt.*]

In May 1858 an act imposing a penny stamp on cheques came into operation. But in cases when money is paid across the counter to the drawer of a cheque himself, such cheque being 'to self,' and not to order, no stamp will be requisite, the cases contemplated in the various stamp acts being those only in which a third party is concerned, and which are held to arise out of transactions of profit. Transfer tickets for customs and other payments, issued by bankers against stamped cheques for the sake of security, are also exempt.

The recent acts, which may be cited as bearing upon the stamp-duty regulations, are those of 17 and 18 Vict. c. 83; 18 and 19 Vict. cc. 27, 36, 78, 82; and 19 and 20 Vict. c. 81.

STANDARD-MARK, a legal assay mark for gold of 22 carats fine, and for silver of 11 oz. 2 dwts. Articles of all standards, capable of bearing a stamp, are marked also with the initials of the maker's name, the arms or mark of the Assay Office, and a letter for the date of the year. Different kinds of letters are used by the Goldsmith's Company; the one now employed is the old black letter. The alphabet was begun in 1856, C being the letter for 1858, and D for 1859. It runs on to 20 letters, J being omitted; a fresh alphabet is then again commenced. The standard-mark for England is a lion passant: for Ireland, a harp crowned. Gold of 18 carats fine, a crown and the figures 18. Silver of the new standard, which is 11 oz. 10 dwts. fine, bears the figure of Britannia.

The HALL-MARK of the Goldsmith's Company, and of the assay offices of particular districts, to articles of gold and silver, is considered the official stamp, and a test of their legal quality. The hall-mark of Birmingham is an anchor; of Chester, three wheatsheaves or a dagger; Dublin, a harp or figure of Britannia; Edinburgh, a thistle, or castle and lion; Exeter, a castle with two wings; Glasgow, a tree and a salmon with a

ring in its mouth; London, a leopard's head; Newcastle-on-Tyne, three castles; Sheffield, a crown; York, five lions and a cross. The date-mark is a letter of the alphabet, which is changed every year, as just described, and differs in different companies.

(Simmonds' *Dict. of Trade Products.*)

STANNARIES, of Devon and Cornwall. By stat. 18 and 19 Vict. c. 32, the jurisdiction of the Stannary Courts has been extended, and some amendments made in their general proceedings.

STARS. [STELLA MIRA. *Supplt.*]

STATIONERS' COMPANY. This Company is of great antiquity, and existed (says Mortimer) long before printing was invented; but it was not incorporated before 3 Philip and Mary, 1555. Their old residence was in Paternoster Row; but their present location is in Stationers' Hall Court. The Company is still of great importance, especially in the City of London, which is the great emporium of the book-trade. [BOOKS, *Supplt.*] Stationers'-Hall is the place, named in the Copyright Act, for the entry of all new publications. Here a Book of Registry is kept by an officer appointed for the purposes of the Act. In this book are registered the proprietorship in the copyright of books, and its assignment, as well as all dramatic and musical pieces. It is at all times open to the inspection of any one on payment of a shilling for every entry searched for and inspected; and on payment of five shillings a copy of any entry in the Book of Registry, with the stamp of the Company, and the Registrar's certificate, can be obtained; which copy is receivable as evidence in all courts of justice, as proof of the proprietorship or assignment of copyright. [COPYRIGHT.]

STATUTE OF FRAUDS, and also the STATUTE OF LIMITATIONS, by the Mercantile Law Amendment Act of 1856, have undergone various amendments, and the law as to guarantees has undergone some improvements.

STAU'ROLITE (Gr. *σταυρὸς* a cross, from the cruciferous appearance of its twin crystals), a mineral of a conchoidal fracture, red-brown colour, and vitreous lustre; specific gravity, 3·27; hardness = 6·75; constituents—silica, alumina, protoxide of iron, and magnesia.

STAVE, in music, the five horizontal and parallel lines, on and between which the notes of a tune or musical piece are placed. Their invention, or at least their adoption, is attributed to Guido, the Italian musician; but Kircher says that in the Jesuits' library at Messina he found a Greek manuscript of hymns more than 700 years old, in which the music was written on staves of eight lines; but probably no use was made of the intervening spaces before Guido's time.

STEAM NAVIGATION. [NAVY, and SHIPPING.]

STEEL (xi. 419–22). Since Mr. Bessemer's new process of manufacturing iron and steel [IRON, *Supplt.*], various methods have been laid before the public; among others, that of Captain Uchatius, Engineer-in-Chief at the Imperial Arsenal of Vienna. Assuming as a basis the well-known affinity of oxygen for carbon, on which Mr. Bessemer's improvement is founded, the present inventor applies it to practical operations by means of cold water instead of cold air. To perform the operation perfectly, and yet rapidly, Captain Uchatius runs the crude molten iron from the furnace into cold water, which is agitated by mechanical means, and thus granulates the metal, and renders it more adapted for its purpose. In this state he mixes it with a cheap oxygen-yielding material, such as sparry iron ore, in a pulverized state, adding, in some cases, a little manganese, and melts the whole in an ordinary cast-steel furnace. The iron is thus separated from the impurities which it contained, and is increased in weight by a portion of that contained in the ore. The manufacture of the steel is finished in the usual manner, the softness of the metal being proportioned to the fineness of the granulation. By these means crude iron is converted into cast steel in little more than two hours. But the Captain's ingenious process appears to be surpassed by the invention of Abbé Paubert, a scientific Frenchman, who, after long and persevering researches into the nature of iron, and its varied combinations with carbon, has found, that in order to obtain different qualities of steel from iron, regard must be paid not only to the purity of the iron, and the quantity of the carbon combined with it, but also to the mode in which the carbon existing in the iron enters into combination with it, and the manner in which crystallization takes place. The results of Abbé Paubert's researches and discoveries were recently tested at Woolwich Dockyard, when the steel was manufactured into clipping and grinding tools, chisels, taps, dies, and other instruments requiring the best quality of metal. A favourable report being forwarded to the Admiralty, it was determined that the newly-manufactured steel should be employed in many of the ordinary purposes for which iron has hitherto been used; such as springs, piston-rods, &c. The economy of its manufacture is also an important consideration. The superior kind of steel fabricated from Swedish iron, costs about 15*l.* a ton, more or less, according to the state of the market; whereas, by the Abbé Paubert's process, the same is procured from British forged pig iron, varying in price from 4*l.* 10*s.* to 5*l.* per ton, and even from old refuse or scrap iron. The conversion of the metal is simply effected by chemical ingredients and electric agency, at a cost not exceeding 1*l.* 5*s.* per ton; nor is there any loss of material whatever, as one ton of the worst iron yields one ton of steel.

The steel produced in India is of such excellent quality that even at this day our manufacturers and chemists are puzzled to understand how it can be done, as the smelting is effected in so primitive a way. The steel appears to be made from the magnetic oxide of iron. In a simple clay-built furnace, the material is heated to a low red heat, and beaten for a long time with stone hammers on a stone anvil. To convert this hammered iron into steel, it is broken into small pieces, and deposited in little crucibles with some dry wood. The crucibles are stopped up with clay, and placed

in a furnace, where they are entirely covered with charcoal. A blast is then applied for two or three hours; the crucibles are removed, allowed to cool, then broken, and the metal taken away. It is found to have changed its character from iron to steel of the best quality.

STEEL-DIES, for Medals, &c. [DIE-SINKING, v. 403.]

STELLA MIRA, in astronomy, the name of a wonderful star, situated in the neck of the Whale (*o* Ceti), whose light undergoes a periodical increase and diminution. It is one of those mysterious stars called *variable*. It was first observed in August 1596, by Fabricius, when it made its appearance as a star of the first magnitude; but was entirely lost sight of before the end of the year. The same star was again seen in 1637, after which it disappeared for nine months. 'The following,' says Milner, 'are now its general phases, which are gone through in 331 days, 15 hours, and 7 minutes. When at the greatest brightness it is equal to a star of the second magnitude, and remains so for about a fortnight. It then decreases during three months, passes entirely out of sight, continues invisible about five months, again comes into view, increases during three months, when it attains once more its maximum lustre. It does not always, however, return to the same degree of brightness, or increase and diminish by the same gradations, or invariably remain invisible the same length of time. For the four years, between October 1672 and December 1676, it was never seen at all, though Hevelius searched that part of the heavens diligently for it. On the other hand, it was unusually bright October 5, 1839, as observed by Argelander.'

STELLITE (Lat. *stella* a star), a mineral of a snow-white colour and shining lustre, occurring in the vicinity of Kilsyth, near Glasgow. The small crystals, of which it is composed, issue like rays from their centres; whence the name of the mineral. Its specific gravity is 2·61; hardness = 3·25; and its constituents—silica, lime, magnesia, alumina, and protoxide of iron.

STENORHYN'CUS (Gr. στενὸς narrow or contracted, and ῥύγχος a trunk, snout, or beak), in zoology, a sub-genus of Cetacea, of the Seal family, and the specific name of the narrow-snouted seal. It is also the name of a genus of Decapod Crustaceans, of the family *Brachyura*.

[The Greek word *Stenos* (narrow, or contracted) is of very general use in the nomenclature of science; as *Stenosauros* (narrow lizard), a genus of extinct Saurians, of the crocodile kind;—*Stenidæ*, a family of Coleopterous insects;—*Stenocarpus* (narrow fruit), a genus of plants, of the order Protaceæ;—*Stenociops* (narrow-eyed), a genus of Decapod Crustaceans, of the family Brachyura;—*Stenodactylus* (narrow-fingered), a genus of reptiles, of the family Geckoidæ;—*Stenography* (contracted writing);—*Stenolobium* (narrow-lobed), a genus of plants, of the order Bignoniaceæ;—*Stenopus* (narrow-footed), a genus of fresh-water Gasteropods;—with a great variety of genera to be found in the nomenclature of Botany, Zoology, &c.]

STEPHENSON, GEORGE, the distinguished engineer, and inventor of the locomotive steam-engine, was born in 1781, at the little colliery village of Wylam, co. Northumberland, situated on the north bank of the Tyne. His father being a humble fireman at a colliery, had not the means of educating his son. At an early age the boy George was employed as a herd-boy; but he made every use of his leisure time in modelling engines in clay. From the duties of the field he was promoted to the task of driving the 'gin-horse' in the colliery. He next rose to be assistant fireman and engine man. At 18 years of age he had not learned to read; but at length he was induced to attend a night-school, and thus he acquired a knowledge of his letters. While employed as a brakesman, at Black Callerton, he added to his scanty earnings by mending boots and shoes. At the age of 20 he fell in love with and married Fanny Henderson, when he removed to Willington, where he worked very hard at a variety of employments; making shoes and lasts, and 'curing' clocks. He next removed to Killingworth Colliery, where he was afterwards appointed engine-wright. In that capacity he made great improvements in pumping-engines, and became eminent as a 'pump-curer.'

It was about the year 1811, that the practicability of locomotive steam-engines began to occupy the serious attention of the public. Stephenson, who from his youth up had been acquainted with the outward and inward conformation of steam-engines, and who had taken hundreds of them to pieces, and put them together again, had long been brooding over the great locomotive subject at Killingworth; and in 1813 he was enabled, with the patronage of Lord Ravensworth, the chief partner in the colliery, to construct the 'Travelling Engine.' This was first placed on the Killingworth Railway on the 24th of July, 1814. This created an immense sensation among the country people, who christened it 'Blutcher,' after one of the military heroes of the day. The constructing of 'Blutcher' was the turning point in the career of George Stephenson. He was eventually appointed engineer to the Stockton and Darlington railways. On the great project of the Liverpool and Manchester Railway, and the difficulties of draining Chat Moss, Mr. Stephenson was examined before a Committee of the House of Commons, and there derided, and denounced for his 'ignorance.' Notwithstanding, our sturdy engineer persevered, overcame all obstacles, and eventually drained Chat Moss. After this, his various engagements and employments increased on every side. His life was now one of perpetual anxiety and labour; yet his habits were simple, frugal, and unassuming. He rapidly rose in the world; and his son Robert, who had received a University education, was his able coadjutor. The father now became a country gentleman. But he was always the same practical, sensible, and honourable George Stephenson. He sternly set his face against the railway mania of 1845, and would have nothing to do with bubble companies, though they offered him enormous sums for almost nominal services.

It was not until the year 1845 that he took an active interest in horticultural pursuits. Then he built new melon-houses, pineries, and vineries of great extent; and seemed as eager to excel all other growers of exotic plants in the neighbourhood as he had been to surpass the villagers of Killingworth in the production of gigantic cabbages and cauliflowers some thirty years before. He also exhibited, during the latter portion of his life, his early affection for birds and animals. He died at his house at Tapton Grange, in 1848, aged 67.

STE'REOSCOPE (Gr. *στερεὸς* solid, and *σκοπὸς* a view), in optics, a binocular instrument for viewing small pictures, consisting of a double tube, through which two objects, taken from different points of view, appear as if concentrated into one, while the relief, or perspective, is so wonderfully brought out, as to make the two pictures look like one *solid* reality, agreeably to the laws of binocular and monocular vision. [SIGHT, xi. 10–12.]

We are indebted to Professor Wheatstone, the discoverer of the electric telegraph, for the first introduction of this curious instrument. In a treatise read by him, on the 'Phenomena of Binocular Vision,' at the Royal Society, in 1838, he there exhibited what is called the *Reflecting Stereoscope*, for the purpose of illustrating his theories of vision. It is thus explained by the editor of 'Novelties, Inventions,' &c.:—'When we are looking at a raised object with one eye, the result is just the same as if we looked at a flat surface, so far as the colours, shades, &c., are skilfully imitated; but when we look with both eyes, the image in the right eye is not exactly like that in the left, because we view it from a different point of sight. It is true that this difference depends only on the small distance between the eyes; but this suffices to produce different ocular results. Wheatstone has shown that our appreciation of raised objects depends mainly on this circumstance; and his stereoscope, or binocular glass, is an ingenious contrivance for making two plain pictures seem to coalesce into one relievo, or raised object.'

This ingenious instrument for some time excited considerable attention in the scientific world; but it has in some measure been superseded by the *Refracting Stereoscope*, for which we are indebted to Sir David Brewster, the inventor of the kaleidoscope. This distinguished philosopher raised many objections to Mr. Wheatstone's theory of binocular vision; and in the prosecution of his various experiments, he was led to construct an instrument which he designated the *Lenticular Stereoscope*. In January 1843 he communicated his views, and the result of his experiments, to the Royal Society of Edinburgh. He afterwards published a very elaborate treatise on the subject, entitled 'The Stereoscope,' which made its appearance in 1856, and from which we extract the following brief description:—'The Lenticular Stereoscope,' says he, 'consists of a pyramidal box of wood or metal, or any other opaque material blackened on the inside, having a lid for the admission of light when the pictures are opaque. The box is open below, in order to let the light pass through the pictures when they are transparent. Another lid is sometimes added, so as to open externally on the bottom of the box, for the purpose of exhibiting dissolving views in the stereoscope. The bottom of the box is generally covered with ground-glass, the surface of which ought to be very fine; or very fine-grained paper may be used. The top of the box consists of two portions, in one of which is the right-eye tube, containing a semi-lens, or quarter lens, and in the other the left-eye tube, also containing a semi-lens, or quarter lens. These two portions may be advantageously made to approach or recede, in order to suit eyes at different distances from one another.'

Since the introduction of Sir D. Brewster's stereoscope, some improvements have been made in their construction; and they are now exhibited in all the mathematical instrument makers' shops. A Mr. Scott has lately taken out a patent for an improved stereoscope, in which he so arranges the double eye-piece, that the rays from the two pictures come to the eye as if they radiated from a point of medium distance, such as that at which we are in the habit of looking at natural objects. The effect is that the eyes of the observer instantly form the combined picture without the slightest pain to the eyes; and the reality of the view is more strongly impressed on the mind, and the pleasing illusion increased. This is done by using entire lenses, and placing their centres a little further apart than the distance betwixt the eyes of the observer.

STEREOTYPING (xi. 452-5). Among the many important uses to which gutta-percha has been applied (*Supplt.* p. 546), that of adapting it to the purposes of stereotyping, as invented by Mr. Muir, of Glasgow, is not the least curious. It is thus described by the editor of 'Novelties, Inventions,' &c.:—'A page of common type is first set up, and well fixed; a warm cake of gutta-percha is applied to it, screwed down tightly, and allowed so to remain a quarter of an hour; when this gutta-percha mould is removed, it is brushed over with fine black-lead, and an electro-copper cast taken from it; the printing is then effected from this cast. It is found that gutta-percha constitutes a very convenient and efficient substance for the mould, owing to the readiness with which it can be softened, and its toughness when cold; while the electro-copper cast is said to bear the action of the printing-press throughout a much greater number of copies than an ordinary stereotype plate. The same inventor also practises a plan in which the gutta-percha performs not only its own work, but that of the electro-copper also. A mould is taken from an engraved wood-block in gutta-percha; and this mould, when brushed over with black-lead, is made to yield a cast also in gutta-percha, in an exactly similar way; and from this cast the impressions are made.'

STERNBERGITE, a mineral of a pink-brown colour, which occurs in crystals so as to form rose-like aggregations. It was so called in honour of Count *Sternberg* of Prague. Its specific gravity is

4·2, hardness = 1·0 to 1·5. Its component parts —silver, iron, and sulphur.

STEVENS, JAMES FRANCIS, F.L.S., the author of 'Illustrations of British Entomology,' and other valuable works of a similar character, was born at Shoreham, in Sussex, in 1792. In his early life he held a situation in the Admiralty Office in Somerset House; but such was his devotion to entomological pursuits, and so celebrated was his collection of insects, that he was eventually appointed to the superintendance of the entomological department of the British Museum; where his valuable services were duly appreciated. He died at Kennington in 1852.

STEVENSON, ROBERT, a distinguished engineer, was born at Glasgow in June 1772; and his name is familiar to the public, as being connected with the construction of the celebrated Bell Rock Lighthouse, which he raised on a rock in the North Sea, a few miles off Arbroath, in Forfarshire. This arduous undertaking was completed in February 1811. He was afterwards employed in various engineering works in Scotland and different parts of the United Kingdom, especially in those connected with bridges, piers, harbours, &c. He died in July 1850.

STILBITE (Gr. *στίλβω* to shine), a mineral of varied colours, from white to brown, and of vitreous lustre; specific gravity, 2·0; hardness, 3·5 to 4·0; constituents—silica, alumina, and lime.

STILPNOMELAN (Gr. *στιλπνὸς* glittering, and *μέλαν* black), a mineral of a dark green or black colour and vitreous lustre, which occurs in crystalline and fibrous masses; specific gravity, 3·27; hardness = 3·0 to 4·0; constituents—silica, protoxide of iron, alumina, lime, and magnesia.

STILPNOSIDERITE (Gr. *στιλπνὸς* glittering, and *σίδηρος* iron), a mineral of a brownish-black colour, with a conchoidal fracture and splendent lustre; specific gravity, 3·6; hardness = 4·5; constituents—oxide of iron, silica, and water.

STIRLINGSHIRE, Scotland (xi. 475–80). According to the census of 1851, the population of the entire county was 86,237. Of inhabited houses there were 11,312. The area of the county was 462 square miles, or 295,875 acres, 200,000 of which are arable. The population of the principal places was as follows:—

Alva . . .	3,058	Grangemouth .	1,488
Bannockburn .	2,627	Kilsyth . . .	3,949
Balfron . . .	1,900	Lennoxtown .	3,108
Carronshore .	2,500	Saint Ninians .	9,851
Denny . . .	2,446	Stirling . bor.	12,837
Falkirk . . .	8,752	——— . . t.	9,361

STOCK-BROKER, a dealer in the public funds and joint-stock companies' shares, licensed by the corporation of London. The body of stock-brokers meet and transact business in the Stock-exchanges, under certain recognised forms and regulations. They are governed by a body elected from among themselves, called the Stock-exchange committee, who manage their general affairs, and decide upon all matters of dispute. In the ready sale or purchase of bank or other stock they are a very useful and trustworthy class of men.

Stock Jobbing, or *Broking*, was contemporaneous with the creation of our national debt, in the reign of William III. (1695), and gave rise to our present race of stock-brokers. In the 'Chronicles and Characters of the Stock-exchange,' published by Mr. Francis, in 1855, appears the following account:—'A new impulse had been given to trade, and the nation was beginning to feel the effect of the revolution. William had already tried his power in the creation of a national debt. Jobbing in the English funds and East India stock succeeded, and the Royal-exchange became—what the Stock-exchange has been since 1700—the rendezvous of those who, having money, hoped to increase it, and of that yet more numerous and pretending class, who, having none themselves, try to gain it from those who have.'

STOCKTON. [CALIFORNIA, *Suppl.*]

STODDART, DR. SIR JOHN, an eminent political writer, was born in Westminster in 1773, and is best known from his editorial connection with the 'Times' newspaper from 1810 to 1817. But such was the violence of his politics, especially as directed against the French government and the deposed Emperor, that he was at length superseded in the editorship, when he immediately commenced an opposition Journal, called 'The New Times;' but it was not successful. He then retired to private life, and practised as an advocate. In 1826 he received the honour of knighthood, and was appointed Judge and Chief Justice of the Vice-Admiralty Court of Malta; the duties of which office he discharged with considerable ability, until his return to England in 1839, when he retired to private life. In the midst of official duties he did not fail to devote his able pen to general literature. He was the author of an 'Introduction to General History,' a 'Universal Grammar, or Science of Language,' and a 'Statistical, Administrative, and Commercial Chart of the United Kingdom.' He died at Brompton, near London, in February 1856.

STONE, FUSIBLE. Patents have been taken out by Mr. H. Adcock of Birmingham, for fusing basaltic stones, by which the most beautiful castings in masonry are being produced. Those for chimney-pieces, flagstones, gas and water pipes, glass roofing for houses and railway stations, &c., are all beautiful and perfect in their kind. The black glass is also capable of being rolled out into slabs, polished and ornamented; it is veined like malachite and marble, and may be applied to a variety of ornamental purposes. The cast stone is also extremely valuable for the construction of light-houses, piers, &c. The most beautiful castings in masonry are now produced by his processes; and a great number of houses and public institutions have been decorated with them.

STRANGFORD, RIGHT HON. LORD VISCOUNT PERCY CLINTON SYDNEY SMYTHE, the celebrated diplomatist, G.C.B., D.C.L., F.R.S., &c., was the eldest son of Lionel fifth Viscount, and born in 1780. He was educated at Trinity College, Dublin, and soon evinced a talent for poetry and general literature. On the death of his father, in 1801, he succeeded to the family title, and became an Irish peer. He was first employed in the diplomatic service of his

country as Secretary of Legation at Lisbon; and he soon exhibited his taste for literature by producing a translation, in 1803, of the poems of Camoens, with a life of the poet. In 1808 his lordship was appointed envoy extraordinary and minister plenipotentiary to the court of Portugal; and before the termination of that year was removed with the Portuguese court to Brazil, where he remained for some years. In 1817 Lord Strangford was appointed minister plenipotentiary to the court of Sweden. In 1820 he succeeded as ambassador to the Ottoman Porte, where he remained till 1824; and the following year was appointed minister plenipotentiary to the Russian court. In 1825 his lordship was raised to the peerage of the United Kingdom, by the title of Lord Penhurst. In 1828 he was engaged in a special mission to the Brazils, with which his diplomatic career was brought to a close, and a pension of 2300*l.* conferred upon him.

The latter portion of Lord Strangford's life appears to have been devoted to literary pursuits. He found occupation in critical and historical pursuits; and thus the love of literature, which distinguished his youth, proved a solace and delight in the evening of his days. He died in 1855.

STRICKLAND, HUGH EDWIN, a distinguished naturalist, was born at Righton, co. York, in 1811. He was an early pupil of Dr. Arnold's, and when at Oriel College, Oxford, he was under the geological tuition of Dr. Buckland. His first practical studies in geology, however, were among the Cotswold Hills, in Gloucestershire, and in the great vale of the Severn. The results of his discoveries were published in the Transactions of the Geological Society, of which he was an active member. In 1835 he travelled over a great portion of Asia Minor, during which he made notes on different objects connected with natural history; and published the results of his observations in the 'Geological Transactions.' Among other papers was 'A General Sketch of the Geology of the Western Part of Asia Minor.' He also published several valuable papers on ornithology, of which he had a most extensive knowledge. His work on 'The Dodo, and its Kindred,' which appeared in 1848, exhibits great judgment and close investigation. At one of the meetings of the British Association for the Advancement of Science, he was the means of a committee being appointed for the purpose of effecting a reform in the nomenclature of natural history, and was the author of the report issued by the committee, which has been found of great utility in the study of zoology. In the midst of his useful labours he was killed by a railway train passing over him, in September 1853, while engaged in the inspection of the cuttings of the Gainsborough and Retford Railway.

STRUON'IDÆ (Lat. *sturio* a sturgeon), a family of cartilaginous fishes (the sturgeons), whose bodies are covered with tubercles or osseous plates.

STRYCHNA'CEÆ (Gr. στρύχνος one of the genera), an order of exogenous plants, consisting of rambling shrubs, with small white flowers.

STUFFING, in natural history, a term applied to the filling of the skin of a dead animal, for the purpose of presenting an exact resemblance, and preserving it from decay. Of stuffed animals innumerable specimens may be seen in our public museums and private collections of natural history. The preparation of these specimens requires a considerable degree of artistic skill; and a variety of processes have, at different times, been adopted by the taxidermist. In the early periods of the art, the naturalist was satisfied with merely removing the brains and the intestines, and adopting means for expelling the animal moisture by heat, or otherwise. The next process was the removal of all the large fleshy muscles, when little was left besides the skin and skeleton. But to all these plans there were strong objections. Independently of the difficulties of properly articulating the different joints and bones, there was the liability to decomposition and putrescent exhalations from decaying animal substances. The modern taxidermist, or stuffer, therefore rejects all but the skin; and with this, as an exterior covering, he forms an animal, which resembles, in every respect, the living prototype. Of these preparations many admirable specimens were seen at the Great Exhibition of 1851. Among others, there was a stuffed elk, from the Zoological Museum at Turin, prepared by M. Combe, which exhibited all the muscular undulations and anatomical details of the living animal, yet with nothing but the skin of the original. It appears that he made a model of this elk in clay; from that model he took a mould, and from the mould a perfect cast in a material that bore some resemblance to papier-maché. The skin of the real animal was then stretched over this cast, which of course corresponded with the original. There were also several representations of stuffed birds and quadrupeds, from the Wurtemburg collection, in various interesting attitudes, which had been prepared by M. Ploucquet, who had stretched the skins upon plaster casts of the respective animals.

STURGEON, WILLIAM, an eminent electrician, was born of humble parents, at Whittingdon, co. Lancaster, in 1783. He was first apprenticed as a shoemaker, and afterwards served in the Royal Artillery as a common soldier. In this latter capacity he employed his spare hours in making experiments in electricity and electromagnetism. He subsequently directed his attention to the construction of plates for galvanic batteries. In a work entitled 'Experimental Researches in Electro Magnetism, Galvanism,' &c., he demonstrated the superiority of amalgamated plates of rolled zinc; and his novel plan of dipping the zinc plates in acid, and then in mercury, is now generally adopted.

Mr. Sturgeon's great practical knowledge of all matters connected with electricity brought him into general notice; and for many years he filled the chair of Experimental Philosophy at Addiscomb Seminary, belonging to the East India Company. During the latter portion of his life he was engaged as lecturer on science at the Royal Victoria Gallery of Practical Science at Manchester. He died in December 1850.

STYLITES, a sort of religious anchorites, who passed their lives on the tops of columns,

for the purpose of indulging in serious thoughts and meditation. They were so called from St. Simeon Stylites, a rigid anchorite of the fifth century, who passed several years of his life on the top of a column thirty-six feet high. Such is the madness of fanaticism. The sect existed till the eleventh century; and even at the present time the Faquirs of India continue to imitate the insane practice.

SUBINFEUDATION, in law, the granting of lands by inferior lords to their dependents. All subinfeudations, which existed previous to the reign of Edward I., were confirmed by the 34th of Edward III.

SUCCESSION DUTIES. [LEGACIES, vii. 918-20; and LEGACY DUTIES, *Suppl.*]

SUCHAW, a magnificent city of China, situated on the banks of the Grand Canal, near its junction with the Yang-tze-kang. It is one of the five cities of the first class of the empire. Shanghae, to which our commercial intercourse was formerly restricted, is a mere outpost; as Gravesend or Woolwich is to London. It is two days' distance from the sea, and accessible only by inland water communication. It is stated that the city contains one million of inhabitants, and that the suburban vicinity contains as many more. The city proper is enclosed within high walls, which are ten miles in circumference. In the western portion of the city there are many great and extensive manufactories of iron, ivory, bone, gold, silver, glass, paper, cotton, and silk. The manufacture of that beautiful silk called *keh sz'*, the knowledge of which is confined to Suchaw, surpasses anything known in Europe in its representations of figures and flowers. We are indebted, for many particulars of this interesting city, to M. Isadore Hedde, an enterprising French traveller, who traversed the city and suburbs in a silk dress without being discovered. He visited the Mint, and ascended the Tiger-nose hill Pagoda, whence he had a good view of the city, the fortifications, the great imperial canal, the rivers, lakes, and streams which intersect the city. He had been commissioned by the French government to obtain all the information possible about the mulberry-tree and the manufacture of silk. He saw fields of mulberry-trees, and learned the mode of their cultivation, visited several establishments, and observed the ingenious apparatus for avoiding double cocoons, the simple process for reeling the fine white silk, named *t's-ih-li*, and the well-known seven cocoon thread. According to his representations the city is most beautiful, and the country around most fruitful. (Montgomery Martin's *China.*)

SUE, EUGENE, the popular French novelist, was the son of an eminent physician, and born in Paris in 1804. He was educated for the medical profession, and having entered that department of the army in 1823, he accompanied the French expedition into Spain. He afterwards entered the medical service of the navy, and was present at the battle of Navarino. Having succeeded to a large property on the death of his father, he renounced the medical profession, and devoted himself to light literature. His first production was a novel called 'Plick et Plock. This was soon succeeded by several others, which wonderfully extended his reputation. He was also a regular contributor to the 'Revue des Deux Mondes,' the 'Revue de Paris,' and other periodicals. About the year 1840 he brought out his novel of 'Mathilde,' which, as presenting a perfect picture of French and especially of Parisian manners, had a most extraordinary run. His next work was the 'Mystères de Paris,' which established his reputation as one of the first of modern novelists. His fame was not confined to France, for it was translated into almost every European language, and had a host of imitators. It depicted the scenes and the evils of social life in glowing colours, and with a masterly pen. This was followed by a political novel, intended as an exposure of the order of the Jesuits, called the 'Juif Errant' (Wandering Jew). He then brought out a Socialist romance, entitled 'Martin l'Enfant Trouvé.' But neither of these were so favourably received as the 'Mysteries of Paris.' In addition to these he wrote several dramatic pieces; but they did not excite any particular attention. In all his writings he appeared so impressed with the miseries and hardships of the working classes, and had demanded a remedy with so much vehemence, that he became identified with the Socialist party; and by them he was elected one of the representatives of the city of Paris, which, at the time, created a deep sensation. As a representative, however, he acted a very moderate part. But such vast influence did his literary talents command among the working classes, that he was universally looked upon as one of the chiefs of the Socialists; and when the republic was overthrown by the Emperor, the name of Sue was incribed on the lists of proscription. He was sent into exile, where he died, in August 1857.

SUFFOLK, County of (xi. 580-90). According to the census of 1851, the population was 337,215; of which 166,308 were males, and 170,907 females. Of houses, inhabited and uninhabited, there were 72,389. The area of the county was 947,681 acres, or 1481 square miles, with 228 persons to a square mile. The population of the principal places was as follows:—

Aldeburgh . .	1,627	Haverhill . .	2,278
Beccles . . .	4,398	Ipswich . . .	32,914
Brandon . .	2,022	Lakenheath .	1,864
Bungay . . .	3,841	Lavenham . .	1,811
Bury St. Edmonds . .	13,900	Long Melford .	2,587
Clare . . .	1,769	Lowestoft . .	6,580
Debenham . .	1,653	Mildenhall High Town .	1,760
Eye . . mun.	2,587	Newmarket .	3,356
— . . parl.	7,531	Southwold . .	2,109
Exning . . .	1,556	Stowmarket .	3,161
Framlingham .	2,450	Sudbury . .	6,043
Gorleston . .	3,999	Wickhambrook	1,597
Glemsford . .	1,626	Wickham Market . . .	1,697
Hadleigh . .	3,338	Woodbridge .	5,161
Halesworth .	2,529		

SUGAR (xi. 590-600). Since 1854 the duties on sugar, from every part of the world, have been equalized; and the quantity in cwts. of raw

cane sugar consumed in this country, from 1853 to 1856, was as follows:—In 1853, 7,307,980 cwts.; in 1854, 8,100,423; in 1855, 7,396,697; and in 1856, 7,240,626. The whole of Brazil is calculated for the production of sugar. The exports from Pernambuco have been yearly increasing. In 1821 this province produced 20,000,000 lbs.; and in 1853 the total produce was 140,000,000; while from every part of Brazil the number of pounds exported in 1855 was 254,765,504 lbs. The usual price at Pernambuco is about three cents per pound for brown, and five cents for pure white sugar. Quantities of the brown sugars of Brazil are sent to the Mediterranean; while the clayed or white sugars are exported to the United States, or to Sweden.

In that useful little work, 'Novelties, Inventions,' &c., appears a curious account of the process of purifying sugar by centrifugal force, which separates the crystallized portions from the molasses. 'When *lump* or *loaf* sugar,' says the writer, 'has been bleached and purified and crystallized, there still remains mixed up with the crystals a yellowish-brown viscid liquid, which will not crystallize; and this must be separated before the beautifully-white sugar will be fit for the market. Under the old method, the sugar-loaf mould was turned upside down, and liquid was made to trickle slowly through the sweet spongy mass; the liquid was either water, or a solution of sugar and water; and the molasses, washed out by these means, escaped by a hole at the small end of the sugar-mould. But it has recently been found that the same remarkable centrifugal action which drives out moisture from cloth will do the same in respect to a mass of wet sugar. The crystallized or granulated sugar, steeped in a murky bath of molasses, is made still more moist with water. About half a hundredweight is put into a sieve-like circular vessel: this vessel is made to rotate 1000 or 1200 times in a minute; and the whole of the molasses and water are driven violently and quickly out of the mass, leaving the sugar in nearly a dry and pure state. M. Van Goethem, a Belgian sugar-refiner, has invented a surprising machine, in which fifty sugar-loaves are ranged radially in a kind of horizontal wheel, and then the whole is made to revolve with the speed of eight hundred revolutions in a minute.'

SULPHATES, in chemistry, the name of those salts which are formed by the union of sulphuric acid with a salifiable base, and which are of frequent occurrence in mineralogy; as sulphates of Alumina, Ammonia, Barytes, Cobalt, Copper, Iron, Lead, Lime, Magnesia, Potash, Soda, Zinc, &c.; which are each explained under their respective heads.

SULPH'URETS, in chemistry, a term applied to the compounds of sulphur with a metal or other simple body, and which are of common occurrence in mineralogy. The most usual are Sulphurets of Antimony, Arsenic, Bismuth, Cobalt, Copper, Lead, Manganese, Mercury, Molybdena, Nickel, Silver, Tin, and Zinc; all of which are noticed in their proper places.

SURNAMES. [NAMES OF PERSONS, *Suppl.*]

SURREY, County of (xi. 655–65). According to the census of 1851, the population of the county was 683,082, including the London district; of which 325,041 were males, and 358,041 females. Of houses, inhabited and uninhabited, there were 114,592. The area of the county was 478,792 acres, and 748 square miles, or 910 persons to a square mile. The population of the principal parishes and towns was as follows:—

Ash	2,630	Kingston-upon-Thames	6,279
Badshot and Runfold	1,733	Leatherhead	2,041
Barnes	1,879	Lingfield	2,141
Bletchingley	1,553	London, part of	482,435
Carshalton	2,411	Merton	1,870
Chertsey	2,743	Mitcham	4,641
Chobham	2,069	Mortlake	3,110
Cobham	1,691	Reigate	4,927
Croydon	10,260	Richmond	9,065
Dorking	3,490	Stoke next Guildford	2,507
Egham	4,482	Thames Ditton	2,351
Epsom	3,390	Walton-on-Thames	2,881
Ewell	2,186	Wimbledon	2,693
Farnham	3,515	Windlesham	1,794
Frimley	1,792	Woking	2,837
Godalming	2,218	Worplesdon	1,549
Godstone	1,657	Yately	2,156
Guildford	6,740		
Kew	1,009		

SUSSEX, County of (xi. 677–87). According to the census of 1851, the population of the county was 336,844; of which 165,772 were males, and 171,072 females. Of houses, inhabited and uninhabited, there were 60,910. The area of the county was 934,841 acres, or 1461 square miles, with 230 persons to each square mile. The population of the principal parishes and towns was as follows:—

Arundel	2,748	Lewes	9,533
Battle	3,849	Lindfield	1,814
Bexhill	2,148	Littlehampton	2,436
Bognor	1,913	Maresfield	1,805
Brighton	69,673	Mayfield	3,055
Burwash	2,227	Midhurst	7,021
Buxted	1,694	New Shoreham	30,553
Chichester	8,662	Ore	1,745
Cuckfield	3,196	Petworth	2,427
Eastbourne	3,433	Pulborough	1,825
East Grinstead	3,820	Rotherfield	3,531
Fletching	2,007	Rye . . mun.	4,071
Frant	2,447	—— . parl.	8,541
Hailsham	1,825	Salehurst	2,191
Hartfield	1,573	Ticehurst	2,850
Hastings mun.	16,966	Uckfield	1,590
—— parl.	17,011	Wadhurst	2,802
Heathfield	2,208	Warbleton	1,509
Hellingley	1,761	Westbourne	2,178
Henfield	1,664	Wisborough Green	1,740
Hove	4,104	Withyam	1,692
Horsham	5,947	Worth	2,475
Hurst Pierrepoint	2,219	Worthing	5,370
Kirdford	1,955		
Lamberhurst, *pt. in Kent*	1,734		

SUTHERLAND, County of, Scotland (xi. 687–91). According to the census of 1851, the

entire population was 25,793; and of inhabited houses there were 4943. The area of the county was 1886 square miles, or 1,207,188 acres. The only town and contributory burgh is Dornoch, with a population of 599.

SWEDEN (xi. 702–27). In 1840 the number of the inhabitants was estimated at 3,138,884; but according to the last census of 1855, the entire population was 3,543,648; with a total area of 165,833 square miles.

SWITZERLAND (xi. 742–62). Mr. Commissioner Kay, in his reports on education, has furnished us with many important particulars respecting the state of education in Switzerland. He states that throughout all the cantons education is compulsory, with the exception of Geneva and Vallais, and the three mountainous cantons situated on the Lake of Lucerne, where the population is too scanty and poor to allow them to erect public schools. There are twelve normal colleges in Switzerland; and each parish is compelled by law to furnish sufficient school-room for the education of its children, and provide a house and salary for the teacher, who is selected from the normal college of the canton. 'All parents,' says Professor Kay, 'are obliged to educate their children, either at home or at a school, from the completion of their fifth to the completion of their fourteenth, and in some cantons till the completion of their sixteenth year. In some of the manufacturing districts the children are permitted to leave school, and enter the mills at the age of eleven years, on condition that they first obtain from the inspectors a certificate of being able to read and write, and that they afterwards attend school a certain number of hours periodically, until they attain the ages of fourteen or fifteen. In the Cantons of Berne, Vaud, Argovie, Zurich, Thurgovie, Lucerne, and Schaffhouse, where the education of the poor has made the greatest progress, all the children, between the ages of six and fifteen, receive daily instruction in the Scriptures, and in reading, writing, arithmetic, history, geography, singing, and drawing.'

To carry into effect these regulations, each canton has a Board of Inspectors, presided over by the Minister of Public Instruction, whose duty it is to visit all the schools of the canton at stated periods. Each parish also has a subordinate Board of Inspectors, elected annually from the educated men of the locality. Would not these regulations afford some useful hints to the directors of our own system of education?

The diffusion of general education among the industrial classes necessarily contributes to the encouragement of reading; and we find that Switzerland, according to a late return, contains 161 printing offices; thus apportioned:—In the cantons of Uri and Unterwalden, 1 each; Zug, 2; Schwytz, 4; Appenzell, Glaris, Bale-Campagne, Turgau, Grisons, and the Valais, 8 each; Schaffhausen, Lucerne, Soleure, and Tessino, 6 each; Neufchatel and Fribourg, 7 each; Bale (city), 9; Vaud, St. Gall, and Geneva, 11 each; Argau, 13; Berne and Zurich, 21 each. Switzerland, taking all the cantons together, has therefore one printing-office for each 16,000 inhabitants; but the average varies very considerably when the cantons are taken separately. Bale (city) has one for every 4000; Geneva, one for every 5000; Schaffhausen, one for every 6000; Zurich, one for every 11,000; Berne, one for every 20,000; Lucerne, one for every 30,000; and the Grisons, one for every 50,000.

According to the census of 1850, the total population was 2,392,740; with an area of 15,179 square miles.

SYENITE. [SIENITE, x. 5.]

SYNANCHI'NÆ, in zoology, a sub-family o the *Scorpænidæ*, the Hog fishes, the body long thick, gross, and without scales, and the mouth wide and vertical.

SYNAP'TIDÆ (Gr. σὺν together, and ἅπτω to join), a family of Echinodermata, of the order *Holothuridæ*. The Synaptidæ are characterized by the entire absence of ambulacra, the motions of the animal being aided by the peculiar processes of the calcareous grains that project from the skin, which gives a roughness to the surface. This family is represented in the British seas by the genus *Chirodota*.

SYNGNA'THIDÆ (Gr. σὺν, and γνάθος a jaw), a family of cheliform fishes, with long slender bodies, and very elongated snouts. The body is covered with a series of scaly indurated plates arranged in parallel lines, and united at the suture. The genus *Syngnathus*, or Pipe-fish, is the type of the family.

SYNODON'TES (Gr. σὺν with, and ὀδόντες teeth), a genus of fishes, of the family *Siluridæ*, with the body nearly oval, and the sides naked; the head and nape mailed, and the cirri of the lower jaw pectinated.

SYRINGODEN'DRON (Gr. σύριγξ a pipe, and δένδρον a tree), a genus of *Sigillaria*, which is found in the coal formation. The name was applied by Count Sternberg on account of the parallel pipe-shaped flutings, which extend from the bottom to the top of the trunks. Many of these genera have the size and appearance of forest trees, and their trunks are without joints.

T.

TAHITE. [OTAHEITE, ix. 176; and *Suppl.*]

TALFOURD, SIR THOMAS NOON, D.C.L., one of the judges of the Court of Common Pleas, and author of the tragedy of 'Ion,' was born at Reading, in 1795. He was educated at the Grammar School there, under Dr. Valpy; and in 1813 was placed under the celebrated special pleader, Mr. Chitty, in whose office he remained for four years. In 1817 he commenced practice as a special pleader; but during the early period of his career he chiefly depended for support upon his literary exertions, especially as law reporter to the *Times* newspaper, and contributor to different periodicals. In February 1821 he was called to the bar by the Middle Temple, and entered on the Oxford Circuit. In 1833 he became a sergeant-at-law; and in 1835 was returned to Parliament for the borough of Reading. In 1848 he was knighted, and made a judge of the Common Pleas. Both in his legislative and judicial capacities he did not fail to distinguish himself on many important occasions. But his claims to be remembered by posterity are chiefly owing to his dramatic productions, of which his tragedy of 'Ion' stands pre-eminent. It is full of exquisite poetry; and manifests throughout a very high order of imagination; although as an acting play it has not continued to maintain its position. Like Dr. Johnson's 'Irene,' it is perhaps better adapted for the closet than the stage. The same remarks may be applied to his 'Athenian Captive,' and his 'Glencoe.' Besides these, he was the author of 'Vacation Rambles,' and the 'Life of Charles Lamb.' He also edited the literary remains of Wm. Hazlitt. His death took place suddenly, while addressing the grand jury at Stafford, on the 13th of March 1854. Mr. Justice Coleridge, in his charge to the grand jury, at the Derby assizes, thus summed up the moral qualifications of Mr. Justice Talfourd:—'He had one ruling purpose of his life,—the doing good to his fellow-creatures in his generation. He was eminently courteous and kind, generous, simple-hearted, of great modesty, of the strictest honour, and of spotless integrity.'

TALMUD (Heb. *lamad* he taught), an ancient Hebrew book, held in great veneration by the Jews, which contains the unwritten or traditionary laws of that ancient people, and embodies the interpretations which the Rabbins affix to the laws of Moses. There are two books of the same name; the one called the Talmud of Jerusalem, and the other of Babylon. The first was composed by Rabbi Johanan, president of the academy of Palestine, about A.D. 300. It consists of two parts, the *Mishna*, or the second law, containing the traditions of the Jewish doctors, collected about the year 190 by Rabbi Judah; and the *Gemara*, or the finishing or completing the whole, which was done by Johanan, and published both together. The Talmud of Babylon contains the Mishna as above, and the Gemara of Rabbi Asa of Babylon, about A.D. 400. This is much more valued than the other, on account of its great clearness or perspicuity, and also for its extensiveness; though it is filled with abundance of fables and ridiculous stories, which the Jews entertain with much eagerness. (Nuttall's *Archæol. Dict.*)

TAN'TALITE, or COL'UMBITE, an opaque mineral of a brownish-black colour, which scratches glass, and sends forth sparks when struck with steel. It is found in single crystals, and in small crystalline masses. It consists of oxides of tantalum, iron, and tin, with a small portion of lime; specific gravity, 6·3 to 6·8; hardness = 6·0.

TARIFF (xi. 864). Of late years the tariff of the United Kingdom has undergone many important changes both in principle and detail, for which we are chiefly indebted to Sir Robert Peel and Mr. Gladstone. The latter, when Chancellor of the Exchequer, in 1853, undertook to develope a grand scheme for establishing the revenue of the country on a permanent basis. His principal object was to show that a remission of duties on certain articles had a tendency rather to increase than to reduce the revenue, by the increased consumption that followed. Agreeably to this idea he proceeded to substitute rated duties for duties *ad valorem*; to abolish those which were unproductive; to merge the differential duties in favour of British colonies and dependencies by reducing foreign articles to the level of the colonial; and, above all, to lower the duties that pressed on foreign articles of food, and which essentially contributed to the comforts of the working masses. On these principles the duties on 126 articles were materially reduced, and on 105 entirely abolished. Though the loss of revenue was immediate, being estimated at nearly a million and a half, still the increased consumption, as anticipated by Mr. Gladstone, more than compensated for the loss. [EXPORTS and IMPORTS; REVENUE, TRADE, TAXES, &c., *Suppl.*]

TARPEIAN ROCK, the mound on which the Roman capital was built, and from which criminals condemned to death were precipitated. It was so called (say the Roman writers) from a vestal called Tarpeia, who betrayed the capital, of which her father was governor, to the Sabines.

TARSUS (Gr. ταρσὸς the sole of the foot, or the palm of the hand), in zoology, and anatomy, the collection of bones which constitute the first part of the foot, and also the small bones between the tibia and the metatarsus. In birds it corresponds to the tarsus and metatarsus conjoined;

and is sometimes applied to the third segment of the leg. In insects the term is applied to the aggregate of minute joints which constitute the fifth principal segment of the foot or leg.

TAXES (xi. 900-902). In 1853, when Mr. Gladstone was Chancellor of the Exchequer, many important changes were effected in the general taxation of the country. Something like uniformity was established in the three kingdoms; and Ireland was rendered liable to the income-tax, from which she had been previously exempt. Instead of three different rates of duty on home-made spirits, which prevailed in the United Kingdom, an approximation was made towards equality, by adding 1*s.* per gallon to the duty on Scotch spirits, and 8*d.* on Irish spirits. In 1855 the duty on the former was made the same as that in England; and in 1858 an entire equalization in Ireland was proposed, with a view of altogether abolishing the practice of smuggling, which formerly prevailed so extensively both in Scotland and the sister kingdom. The soap duty was entirely abolished. The complex system of assessed taxes was entirely remodelled, and reduced to something like uniformity and simplicity. The duties on stamps underwent some important alterations [STAMP ACTS, *Supplt.*]; and a new tax was levied on succession to freehold property, which very materially added to the revenue. [LEGACY DUTIES, *Supplt.*]

Of the taxes repealed or reduced, during the year 1853, those on tea, butter, cheese, sugar, raisins, and other articles, amounted to 1,499,474*l.*; while the excise reduction on soap, stamps, and assessed taxes was 1,775,000*l.* In 1854 the reduction amounted to 1,284,107*l.*; in 1855, to 312,960*l.*; in 1856 to 2,203,474*l.*; and in 1857 (including the large items of coffee, tea, and income-tax) to 10,753,582*l.* In 1858 the income-tax was reduced to 5*d.* in the pound, which caused a deficiency of 2,000,000*l.* During the same year both English and Scotch spirits show a falling-off in home consumption—the former from 10,199,567 to 10,028,591 gallons, and the latter from 7,030,823 to 6,781,879 gallons. Malt increased from 36,715,154 to 37,237,389 bushels in England, and decreased from 5,137,281 to 4,995,369 bushels in Scotland; and hops increased from 46,267,457 to 48,948,786 lbs. The quantity of paper charged with duty and free of duty, in 1858, was 42,612,630 lbs., of which 3,099,395 were exported, and 39,513,235 retained for home consumption—the latter being only 27,313 lbs. different from 1857.

The imposition of new taxes, in 1853, including the customs, excise, &c., amounted to 3,356,383*l.*; in 1854 (during the war with Russia) to 9,954,643*l.*; in 1855 to 5,225,907*l.*; in 1856 and 1857, *nil.*; and in 1858 to 800,000*l.* [REVENUE, TARIFF, TRADE, &c., *Supplt.*]

TAX'IDERMY. [STUFFING, *Supplt.*]

TAYLOR, GENERAL ZACHARY, President of the United States of America, was born in Orange county, Virginia, in 1786. When he was only a few months old, his father, Colonel Richard Taylor, migrated with his family to Kentucky, where he was one of the earliest pioneers. Young Taylor, as he grew up, assisted his father in the labours of the field during the summer months; and in winter he attended school, whenever a school, however distant, was accessible. He had scarcely arrived at manhood, when some movements in the west appeared to threaten the integrity of the Union, and he enrolled himself, with enthusiasm, in a troop raised to oppose the design. He had an elder brother, who was a lieutenant in the army; and on his death he was, through the influence of his relative, James Madison, appointed to the vacancy by President Jefferson, in 1808. He was soon engaged in active service, and displayed all the qualities of a brave and accomplished soldier. By his gallant defence of Fort Harrison, against great odds, he saved his country from devastation. From that exploit his fame gradually rose, as he went gallantly on through a service of forty years, until his successful campaign against Mexico, which secured the gold-producing regions of California. In the United States, to the many traits of his military career his countrymen point with the greatest pride. He distinguished himself in what is known as the Indian war in the north-west; for his victories in the Florida war, for his two great battles in the field, for his capture of the city of Monterey, which was strongly fortified, and occupied by a superior force; and finally, for his gallant defeat of 25,000 men under Santa Anna, by a force of 4000 volunteers, who had never been in action, and who were only aided by 300 regulars. Indeed his prudence, skill, and gallantry, during the whole of the Mexican campaign, are matters of history, and need not be recapitulated here. On his triumphant return from Mexico his friends put him in nomination for the high office of President; and in 1848 he was elected by a majority of thirty-six electoral votes over his opponent General Cass. The term of his office commenced in March 1849; but he did not long survive his election; for his death took place at Washington on the 9th of July, 1850. The American senate immediately passed a resolution for erecting a suitable monument to his memory, as a tribute of national gratitude for his long and arduous services.

TAYLOR, DR. WM. COOKE, an eminent writer, and a man of sound learning, was born at Youghall, co. Cork, in 1800. After the usual course of education he prosecuted his studies with distinction at the university of Dublin. He afterwards repaired to London, and entered into the career of literature with great success. Among his principal works were his 'Manuals of Ancient and Modern History,' 'Life and Times of Sir Robert Peel,' 'Revolutions and Remarkable Conspiracies of Europe,' and 'History of Mohammedanism.' In 1846 he was employed by the British Government to inquire into the system of education on the Continent; and he was about to be placed on the staff of the lord-lieutenant of Ireland, for the purpose of carrying out his views, when he was seized with the prevailing epidemic, which terminated his existence in 1849. A few weeks before his death he had brought out a work of considerable merit and importance, entitled 'The History of the House of Orleans.'

TCHE-KIANG, a large and important province of China, of which Ningpo, on the banks of the great river Takia, is the capital. It contains eighty-nine cities and large towns, with a population of upwards of 26,000,000. The mouth of the river Takia is only nine leagues distant from the harbour of Chusan, on the eastern coast of China, and an immense trade is there carried on.

TCHERNAYA, the name of a village and small river on the south-east of Sebastopol, where a sanguinary battle was fought between the Anglo-French and Russian forces on the 16th of August, 1855. The attack commenced on the part of the Russians, who suddenly crossed the river at several points; but they were gallantly received by an unerring fire, from the combined forces of England, France, and Sardinia, and driven back with great slaughter to their former position. The loss of the Russians on this occasion was estimated at upwards of 5000 killed and wounded. [SEBASTOPOL, *Supplt.*]

TEGNER, ESAIAS, though comparatively little known in England, is generally acknowledged by his countrymen to be the most distinguished of Swedish poets. He was the son of a peasant, and born at Kynkerud, in Wermland, in 1782. Having an early disposition for study and the acquisition of knowledge, he was sent as a student to the university of Lund, and in due course became a parish priest. He had all the difficulties of early poverty to struggle with; but he eventually succeeded in obtaining the professorship of Greek in the above university; and was thus enabled to devote himself to the cultivation of poetry, as well as to the duties of his profession. His poetical works were extremely numerous, and most of them evince the highest powers of imaginative genius and heart-stirring pathos. Among others may be mentioned his 'War Song of the Scanian Land Defenders' (1808); his 'Svea,' a patriotic poem (1811); and a romantic tale of ancient Scandinavia, entitled 'Frithiofs Saga,' (1820, 1825), which became the most popular poem that has ever appeared in Sweden; and has tended to immortalize his name as the great Scandinavian bard. In 1824 he was elected to the bishopric of Wexio; and in that high position he performed the duties of his prelatical office with much dignity and credit. So high an opinion did the clergy entertain of his conduct and abilities, that in 1839 he was proposed as one of the three candidates for the archbishopric of Upsal. But his overwrought mind soon afterwards gave way; and in 1840 he was the inmate of a lunatic asylum. Although he partially recovered from this melancholy shock, still his constitution became enfeebled; his health declined; and he died, from a stroke of apoplexy, in November 1846. In 1847–8, Tegner's works were collected and published in six volumes at Stockholm, under the superintendance of his son-in-law, Professor Böttiger.

TEIDÆ, a family of Saurians, as illustrated by the *Teius tegnicin* of the British Museum catalogue. They are natives of the warm latitudes of America, where they are of considerable size, from four to five feet in length. There are various genera, as the *Teius*, which forms the type of the family; the *Callopistes*, the *Ameiva*, the *Cnemidophorus*, *Dicrodon*, *Acrantus*, &c.

TELEGRAPH, ELECTRIC (xi. 915–20). An account of the discovery and application of this wonderful agent in viarian and submarine communication has already been given; and its history brought down to the year 1850, when the telegraphic wire was carried across the Straits of Dover to the French coast. In 1851 the French government granted a monopoly for ten years to the projectors of an electric telegraph between England and France. In 1852 the line was completed, and the monopoly was extended for ten years from the time of completion, reserving to the French government the right of laying the lines. In 1853 the British Parliament voted 30,000*l.* for the purpose of laying down a telegraphic line between the two countries; but they were encountered with the claim of monopoly, and the money could not be applied. Since that period, the extension of the telegraphic wire has been surprising. It has been estimated that there were in 1858 upwards of 78,350 miles of telegraphs constructed and in progress of construction:—In Europe, 37,900 miles; United States, 33,000; India, 5000; South America, 1500; and Submarine—Europe and America, 900 miles; and these last were independent of the Atlantic telegraph of 1700 miles.

On all the lines of railway, with their various ramifications, north, east, south, and west, the telegraphic wires are in full operation, and thus hold almost instantaneous communication with every part of the empire. From Charing Cross, from Cornhill, from the government offices, and numerous other places in the metropolis, the electric messages are quickly flashing to Aberdeen in the north, to Southampton in the south; to Dover in the east; and to Plymouth, Falmouth, Liverpool, Holyhead, or Dublin, in the west, and north-west; and the charges for each message have been reduced to a very moderate scale. Moreover, in the Crimean and the East Indian wars, the telegraph played a prominent part. In the midst of a hostile country, and under the thickest fire, the telegraphic wire was carried along, and served the most important purposes on the field of battle.

At the eleventh annual Exhibition of patented inventions by the Society of Arts, which took place in April 1859, there were various specimens of modifications in the form of electric telegraphic cables, some of which, in cases of injury, are self-restoring. But the most curious, and that which promises to be of great utility in the conveyance of messages, was a type-printing telegraph instrument, exhibited by Professor Hughes. It enables messages to be printed in type-letters by means of a single wire, without loss of time in the signal—a difficulty which has hitherto prevented the commercial use of mechanical printing telegraphs.

For the general extension of telegraphy in the East Indies, as well as in the transatlantic portion of the world, see HINDUSTAN and the UNITED STATES (*Supplt.*).

The conducting of the submarine telegraph across the Irish channel, and through the depths of the Mediterranean, were undertakings of vast magnitude and importance. The former has opened instantaneous communication with the western shores of the sister isle; and the latter has connected the European with the great African continent. The line which has been carried from Sardinia to Malta is 450 miles in length, and that from Malta to Corfu 350 miles. The submarine telegraph from Spezzia, in the Genoese state, to Cagliari in Sardinia, has enabled the French government still further to extend it from Cagliari to Africa.

But of all the undertakings of modern times, that of carrying a submarine telegraph across the wide Atlantic, and thus uniting the distant continents of Europe and America, is the most extraordinary. 'To Professor Morse, of America,' says Mr. Whitehouse, 'belongs the honour of the first-published opinion in 1842, declaring the possibility of connecting Europe and America by telegraph. The first step of actual progress was the discovery of gutta-percha and its properties as an insulating medium. In 1847 and 1848 the use of underground wire, insulated with gutta-percha, was proposed and adopted in England by Charles V. Walker, Esq., F.R.S., and in Prussia by Werner Siemens, of Berlin. The first submarine experiment made in the open sea by use of gutta-percha was made January 10, 1849, by Charles V. Walker, Esq. He attached two miles of insulated wire, submerged in the sea, to the end of one of the wires of the South-Eastern Company's system, at Folkestone, and spoke through it to the directors in London from the deck of the steamer. In 1856 a company was formed for the purpose of laying down a submarine Atlantic telegraph, and the governments of England and the United States each agreed to render every assistance to the undertaking, by furnishing the ships and sailors which should be required in laying down the cable. The electrical details of the undertaking were placed under the care and direction of Mr. Edward O. W. Whitehouse, who was styled the 'Electrician Projector of the Atlantic Telegraph.' At the same time a company, which had been incorporated by the legislature of Newfoundland in 1854, transferred all their privileges to the Atlantic company, to whom the exclusive privilege of landing a cable upon the shores of Newfoundland for fifty years were formally secured; the patent right being conferred upon Messrs. Whitehouse and Bright. The history of the undertaking, the difficulties which the directors and managers had to encounter, its primary failure, and its eventual success, present a series of interesting details, which have been recorded by Mr. Whitehouse in a communication dated Sept. 18, 1858, after it had been discovered that, from some unaccountable cause, the telegraphic wire failed to answer the objects in view. The following is a brief abstract of Mr. Whitehouse's elaborate statement:—

In Jan. 1850 (says Mr. Whitehouse), the Messrs. Brett projected and obtained concessions for a line across the Channel; in order to secure which it was necessary to carry a temporary line across at once, and demonstrate its capability before the 1st September of the same year. Success crowned their efforts on August 20, 1850, and from that day all doubts as to the possibility of submarine telegraphs were set at rest. A cable of massive construction was laid on September 25, 1851. It was in March 1855 that Mr. Whitehouse was led to pursue with diligence the investigation of the subject; when results of intense interest and of the highest value were obtained; some of which were laid before the British Association at their meetings at Glasgow and Cheltenham in 1855 and 1856, with the special object of exciting an interest in and aiding the cause of Atlantic telegraphy. Observations upon the velocity of the electric current under varying circumstances (amounting to many thousands in number) were made upon different lengths of cable in process of manufacture, and the encouraging fact was brought to light that, by simply altering the electrical conditions, the transmission of a wave of force through a given distance can be materially accelerated; and, in fact, that not only can a great economy be attained in the time of transit of each wave, but also that a proportionately greater number of currents can be sent through the same distance in the same time.

The first combined experiment which was made by Mr. Whitehouse's instruments, took place on November 5, 1855. The wires were connected so as to form a single unbroken length of 660 miles, from London to Dublin, which was signalled through both ways, by use of Mr. Whitehouse's instruments, with perfect success on the first and only occasion of trial. Subsequently, in the autumn of 1856, Mr. Cyrus Field took occasion to engage Mr. Whitehouse's active co-operation in the great work, admitting him to fair participation therein, and recognising him, by agreement, as one of the original projectors of the Atlantic Telegraph. The arrival of Professor Morse in England enabled Mr. Whitehouse to repeat experiments upon many points for his satisfaction at Greenwich and Blackwall. Cables, containing wires whose aggregate length amounted to nearly 1200 miles, were at his disposal for a considerable time. The testing of the cable during the process of its manufacture presented points of difficulty and new phenomena of great interest. In order to determine the best form of cable, great numbers of specimens were made, and of various constructions—some excelling in strength, some in flexibility. They were limited to an average weight of not more than a ton per mile. These were subjected to the most critical trials for strength and flexibility, and the question of their mechanical fitness was, in this respect, fairly exhausted. It was not until a considerable length of cable had been manufactured at Greenwich, that Mr. Whitehouse was enabled to commence trials of a set of experimental instruments made for the special purpose of determining the exact form, size, and structure of induction-coils best suited to his purpose. The time fixed for the

departure of the expedition was now so near at hand that it became necessary to complete the instruments without delay. On trying them through 1200 miles of cable, when that length was finished, shortly before the sailing of the expedition, it was satisfactory to find that there was ample power in the generating apparatus for the whole distance.

The loss of the cable in the autumn of 1857 caused a temporary paralysis of all their efforts. While, however, it postponed the accomplishment of their wishes, it tended towards insuring the success of their labours at a future time. It had been, in fact, a rehearsal, but made at great cost.

A few weeks before the sailing of the expedition in 1858, the principal improvements in instruments had been completed and tested repeatedly in every possible way. The final instruments for each station, embodying these improvements, were ordered and put in hand at Henley's, the best manufacturer in London. The last two or three weeks before the departure of the vessels from Keyham was necessarily a period of considerable excitement. The expedition sailed, bearing with it the good wishes of all, and the sanguine hopes of few, if any, of those connected with the undertaking. The arrival of the *Agamemnon* and *Niagara* at Valentia and Trinity Bays respectively took place within a few hours of each other. The ends of the cable were now landed, the distant one in an almost wilderness at the head of Trinity Bay, our own on Valentia Island. By midnight on the fourth day after the landing of the end, the speaking instruments at Newfoundland were sufficiently adjusted for them to work. Sentences and messages were communicated; and the difficulty which was experienced in reading the signals from our side of the line was attributed to the injury, or still imperfect adjustment, of the delicate receiving instruments carried out in the *Niagara* and *Gorgon*. But the gradually-decreasing strength of our current, as received at Newfoundland, soon made it evident that slight but gradually-increasing injury to the cable at this end was the cause of the embarrassment. This continued to increase, till they were reduced to reading our signals by a barely-visible movement of their most sensitive detector—half a degree—while we received more than a hundred times this amount of force from them. Our mode of working was then modified to suit the altered condition of the conductor—voltaic currents of low intensity being employed, and the signals being sent at their request much more slowly than before. Soon, however, they ceased to receive even this feeble trace of communication from us, while yet their signals as received by us were of ample strength. After a time these also began to diminish very considerably in force, and it became evident that the injury the telegraphic line had sustained was gradually increasing, until at length the communication entirely ceased.

This inexplicable failure, in the great object of the Atlantic Telegraph Company, caused much disappointment in the public mind; and the enterprising adventurers sustained considerable loss.

On the 28th of February, 1859, the Directors of the Submarine Telegraph Company, issued their report, in which they state that the number of messages actually transmitted, in the first half of 1858, amounted to 49,378, and realised a sum of 12,520*l.* 10*s.* 4*d.*; while the number of messages in the last six months was 51,702; but owing to some reductions of the tariff, the cash received was 12,037*l.* 3*s.* 2*d.*, or about 500*l.* less than the previous amount. The company proposed to lay down a cable, containing six conducting wires, between Boulogne and Folkestone, during the summer of 1859, and thus to have an increased number of direct wires between London and Paris, and the other important towns on the Continent. It is intended that one of these wires should be devoted to the sole use of the London and Paris Stock Exchanges, so that the prices of the two money markets will be interchanged almost instantaneously, and all the existing delays and inconveniences will be abolished. When the Submarine Company opened their line between France and England, the first charges for messages were as follows:—Original minimum charge—Paris to London, 19*s.*; Paris to Liverpool, 1*l.* 11*s.* Present minimum charge—Paris to London, 8*s.* 6*d.*; Paris to Liverpool, or any telegraph station in Great Britain or Ireland, 8*s.* 6*d.* The contractors are under obligations to complete and lay down the cable to Denmark by the 30th June, 1859. This year will therefore form an important epoch in the Company's existence. Instead of possessing only two cables between Great Britain and the Continent, containing ten conducting wires, they will have five cables and twenty-one wires capable of transmitting messages.

TELLIN'IDÆ (Gr. τελλίνη a species of mussels), a family of bivalve Mollusca, of which the *Tellininæ* are the sub-family, and *Tellina* the genus. The shells of this family are equivalve, and rarely covered with an epidermis.

TEMPESTS. [CURRENTS OF THE ATMOSPHERE, *Supplt.*]

TENANT AND LANDLORD (xi. 941-44). The Common Law Procedure Act of 1852 has entirely superseded the old modes of proceeding. Besides the remedies given to landlords by stat. 1 and 2 Vict. c. 74, as explained in p. 944, another summary mode of recovering possession of premises, when held over by a tenant, and the rent does not exceed 50*l.*, is afforded by action of ejectment in the County Court. [COUNTY COURTS, *Supplt.*]

TENNANT, WILLIAM, Professor of Oriental languages at St. Andrews, was born at Easter Anstruther, co. Fife, in 1785. His early life was clouded with two unpropitious circumstances; the first was poverty, and the next, a lameness in both his limbs, which entirely prevented him from entering into the activities of life. But such was his unremitting devotion to the study of languages, that his intellectual acquirements made ample amends for his poverty and physical disablements. At 15 he was sent

to the University of St. Andrew's; but it was little that this seminary of learning did for him in comparison with what he achieved for himself. After remaining two years at the University, he was called away to fill the office of clerk to his brother, a corn-merchant. He did not, however, in this humble position, neglect his favourite studies. In 1812 he made his appearance before the world as a poet; and brought out his 'Anster Fair,' which was very successful, and new editions were printed in 1814 and 1838. It is a humorous sort of fairy tale, written in ottava rima, of which Maggie Lauder is the heroine. In 1813 Mr. Tennant was appointed schoolmaster of the small parish of Denino. In 1816, however, he was transferred to the more lucrative situation of Lasswade; and in 1819 he was elected teacher of classical and schoolmaster of Oriental languages in the Academy of Dollar. From this situation he was called, in 1837, to fill the chair of Oriental Languages in the University of St. Andrew's. In 1840 he published a Syriac and Chaldee Grammar, and since then he has given to the world a volume of Hebrew dramas. Besides his 'Anster Fair,' Mr. Tennant was the author of 'Cardinal Beaton, a Tragedy,' and various small poems. 'Of all his poetical writings,' the Fifeshire Journal observes, 'it may be said that the execution is most excellent, while the selection of the subjects is such as prevents them from becoming extensively popular.' He died in October 1848.

TER'APHIM, or THER'APHIM, among the Hebrews, and other Eastern nations, were certain images or superstitious figures, to which extraordinary influences were attributed. They are mentioned in the Old Testament; and by some are supposed to have been a kind of Penates, or household deities; while others consider them as talismans, or metallic figures cast under particular aspects of the planets (Judges xviii. 14) — a superstition to which the people of the East were much addicted. Kircher says that the word is of Egyptian origin; but Spencer, in his dissertation on the Urim and Thummim, asserts that it is Chaldee, and signifies the same as Seraphim; the Chaldeans being frequently known to change the ש into ת, that is, *s* into *t*. He adds, that those images were borrowed from the Amorites, Chaldeans, or Syrians; and that the Serapis of the Egyptians is the same thing with the Theraphim of the Chaldeans. (Selden, *De Diis, Syriis.*) The flight of Rachel with her father's teraphim has been a subject of much speculation among commentators; some maintaining that she stole them because she was addicted to the worship of idols, and others that she was desirous of removing the objects of her father's idolatry.

TEREBRAT'ULA (Lat. *terebro* to bore), a genus of bivalve Mollusca, so called from one of the valves being perforated for the transmission of a peduncle. Numerous species of the terebratula are found in a fossil state, chiefly in the Caradoc group of the Silurian system. From the incalculable antiquity of their lineage they have been denominated the Fossil Aristocracy. The genus is found in great numbers in the chalk, but of species different from those in the silurian strata.

[The Latin word *terebro* (to bore) is of frequent application as a prefix to Zoological terms; as *Terebra*, a genus of Mollusca, belonging to the Buccininæ;—*Terebralia*, a genus of testaceous Gasteropods, of the family Strombidæ;—*Terebrantia* (the Borers), a section of Hymenopterous insects, characterized by an anal instrument which perforates the bodies of animals, or the substances of plants, for the depositing of their eggs;—*Terebratulite*, a fossil terebratula, &c.]

TERRE-VERTE (Ital. *green earth*), a species of chlorite, of an olive or green colour, which, according to Klaproth, is a hydrated silicate of oxide of iron and potash, with a portion of alumina and magnesia. It occurs in Italy, France, Germany, and North America.

TERRO-METALLIC, a metallic earth, produced from the mixture of several kinds of clay, after being pulverized and tempered to a very fine state, from which a compound of iron-like hardness is formed. It was first introduced by Mr. Peake, a potter of Burslem, in Staffordshire. The heat at which the material is fired is such as to ensure perfect hardness, and at the same time produce a natural glaze. The articles manufactured from this material chiefly consist of tiles for draining, roofing, copings, flues, ovens, kilns, &c.

TERZA-RIMA (Ital. *triple rhyme*), a species of complicated versification, adopted by the Italians from the Troubadours, and sometimes practised in England. The verses usually consist of eleven syllables; the first and second verses rhyming together, as well as the second, fourth, and sixth; the fifth, seventh, and ninth; the eighth, tenth, and twelfth, and so on; the last two lines of the canto forming a couplet.

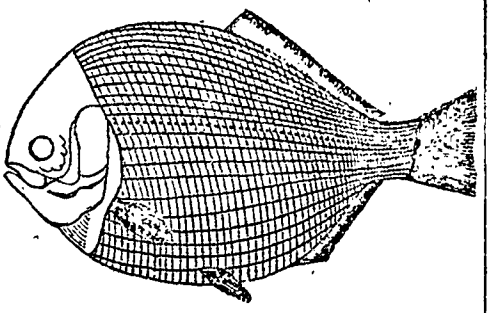
TESSELLATED PAVEMENTS. [Mosaics, viii. 732, and *Supplt.*]

TESTA'CEA (Lat. *testa* a shell), those families of Mollusca which secrete a shell. They differ from the Crustacea in retaining their shells during life, while the latter cast them periodically; the shell of the one being carbonate, and of the other, phosphate of lime.

TESTU'DO (Lat. *a tortoise*), among the Romans a large wooden tower, which moved on wheels, and was so called from its presumed strength. It was covered with bullocks' hides, and was intended to protect the soldiers during their attack on the walls of a town. The term was also applied to a peculiar form of battle, which was intended as a defence in sieges against the missiles of the enemy. The soldiers, with their shields over their heads, presented the appearance of a sloping roof, or tortoise's back; the first rank standing upright; the next ranks stooping lower and lower, and the last one kneeling. Among the Roman poets the term was applied to the ancient lyre, because it was originally made of the hollow shell of the sea-tortoise.

TETRAGONOL'EPIS (Gr τέτρα four, γωνία an angle, and λεπὶς a scale), a genus of fossil

fishes found in the lias formation of Devonshire, of which the annexed is a restored form.



TETRAGONOLEPIS.
(*Of the Lias formation.*)

TETRAGRAM'MATON (Gr. *four letters*), a term in use among the ancients for expressing the mystic number *four*, because it was supposed to symbolize the Deity; that sacred name being expressed, in most languages, by four letters; as the Hebrew יהוה, the Egyptian *Amon*, the Assyrian *Adad*, the Persian *Syre*, the Greek Θεὸς, the Latin *Deus*, or *Jove*, the Arabic *Alla*, &c.

THALAM'IFLORÆ (Gr. θάλαμος a bed, and Lat. *flos* a flower), a sub-class of Exogenous plants, comprehending all the polyandrous genera of Linnæus. The calices consist of numerous petals, with which the stamens are inserted in the receptacle; this forming the distinctive characteristic of the class.

THALI'A (Gr. θάλεια blooming one), the Muse of pastoral and comic poetry. [MUSES.]

THAMES (xi. 987–91). The putrescent state of this noble river during the summer months, arising from the vast influx of the Metropolitan sewerage, and the legislative remedies to be applied, have already been noticed. [LONDON, *Suppl.*, p. 660.] Many scientific analyses of the state of the Thames water have been made. But that given by Dr. Letheby, the great practical chemist, is perhaps the most philosophical. From his valuable report on the subject, we make the following extract:—'I have been engaged for some time past,' says he, 'in making daily examinations of Thames water at different points between Teddington-lock and Greenwich, and the results of those examinations are, that the river is unusually charged with sea salt and organic matter. The oceanic tide in the river has risen as high as Wandsworth, and has thus contaminated the water with saline and other impurities of the sea. As a rule, the soluble inorganic constituents of the river do not exceed 45 grains in the gallon at high tide at London Bridge, and the organic impurity is not more than 4 grains in the gallon; but within a short period the saline elements have amounted to 131 grains in the gallon, and the organic to 12. Now, all experience proves that whenever such a mixture as this occurs at high temperature, putrefaction of a most offensive character is set up. The sewage and the organic matter and sulphates of the sea water have acted on each other, and have produced the state of things with which we have lately been so familiar. The inky appearance of the river has been caused by the fixation of the sulphuretted hydrogen by the iron of the clay. This has been the salvation of our lives, for, offensive as has been the vapour evolved from the river, it is as nothing in comparison with what it would have been, if the much-abused clay from the lower shores of the river had not fixed the miasm in a solid, involatile form. As it is, however, the gases evolved from the water amount to about 15 cubic inches per gallon. They consist chiefly of carbonic acid with ammonia, nitrogen, and a trace of oxygen. They do not contain sulphureted hydrogen, but they contain a stinking vapour, which is in the highest degree offensive, and which inhaled produces slight head-ache, giddiness, and nausea. The water at midstream is charged with the higher forms of animal and vegetable infusorial life; but that at the shore is so lethal in its qualities that nothing exists in it but the lowest forms of fungi and the simplest of living creatures.'

An eminent physician (Dr. Challice) also informs us that he is daily consulted by patients who have been seized by nausea, sickness, or diarrhœa, arising from the effects of the fetid effluvia from the river. A Thames waterman was seized with the Asiatic cholera, which proved fatal; and the surgeon who attended him stated that the disease was caused by the noxious exhalations of the river. Its putrescent and dangerous state is still more forcibly illustrated by the fact, that near Battersea Bridge a man was seen taking the fish out of the water without the aid of either net or hook, the fish being so sickened and enfeebled by the poisonous state of the water that they appear to have lost all power of escape.

Spanning the river Thames there are six noble bridges—London, Southwark, Blackfriars, Waterloo, Westminster, and Vauxhall; the Southwark and Vauxhall Bridges being built of iron, and the others of solid masonry. There are also two suspension-bridges, the one extending from Hungerford Market to Lambeth, and the other from Chelsea to Battersea Park. The last one is an elegant carriage structure. There are likewise several bridges over different parts of the river from Chelsea to Richmond; but they are of minor importance.

One of the greatest undertakings of modern times, however, was that of excavating a *Tunnel* beneath the deep bed of the river, from Wapping to Rotherhithe, which has opened a foot thoroughfare from one side of the Thames to the other (that is, from Middlesex to Surrey), where no bridge could have been erected, owing to the crowded state of the shipping in that part of the river. It was a work of immense labour, the cost of which was about 1000*l.* a foot; and the enormous sum of 800,000*l.* was expended. Mr. Brunel was the engineer who planned and conducted the operations. The horizontal excavation for the body of the tunnel was commenced at the depth of 63 feet, with a declivity of 2 feet 3 inches every 100 feet. The breadth of the tunnel is 38 feet, and the height 22 feet 6 inches; thus pre-

senting a sectional area of 85 feet. The basis of the excavation, in the deepest part of the river, is 76 feet below high-water mark. On two different occasions the river broke in upon the workmen, and suspended their operations for a considerable time; but the injury was repaired by filling bags with clay, and throwing them into the Thames immediately over the chasm made in the bed of the river.

THAMNOPHILI'NÆ (Gr. θάμνος a bush, and φιλέω to love), in ornithology, a sub-family of the *Laniadæ*, or Shrikes, of which the *Thamnophilus* (bush-loving) is the type.

THEBAID, in classical literature, the name of a celebrated poem, written by Statius, the Roman poet, the subject of which is the civil war of Thebes between the two brothers Polynices and Eteocles.

THEOCHRISTOPHILAN'THROPISTS (Gr. Θεὸς God, Χριστὸς Christ, and φιλάνθρωπος lover of men), the name of a sect of Christian Deists, which was established during the French revolution. In Paris the Directory granted them the use of ten parish churches; but in 1802 the Consul forbade them the use of these places of worship, and the sect soon afterwards became extinct.

THERAPEU'TICS (Gr. θεραπεύω to heal, or cure), (xii. 30). Among the many important compounds which have been lately introduced into the Materia Medica, may be mentioned those therapeutic agents which have received the name of *Anæsthetics*. Their property, when applied to the human system, is to produce, by acting on the nervous tissue, either a general or local insensibility. It was not till 1847 that anæsthetic agents were introduced as a means of alleviating pain during surgical operations. Two American gentlemen, Drs. Morton and Jackson, first made experiments on human beings with nitrous oxide, or laughing gas, and discovered that it produced a state of insensibility, during which surgical operations could be performed. They further improved upon this discovery by the application of ether, which was found preferable to the nitrous oxide, and much more effective. It was soon ascertained that other anæsthetic agents had the same properties; and at Edinburgh the subject was investigated with great success. At length Dr. Simpson, discovered that the terchloride of formyle, or chloroform, acted much more effectively than ether or any other known agent; and from this period chloroform has been the substance in most general use for producing anæsthesia by artificial means. [Chloroform, iv. 514.]

There are many other sanative agents with which the therapeutic art has been lately enriched. Among these may be enumerated:—*Chromic Acid*, which has been found extremely beneficial when applied to the cure of warts and tumours;—*Cod Liver Oil*, is used as a remedy in chronic rheumatism;—*Chlorine*, *Oxygen*, &c., are applied as *Deodorizers* and *Disinfectants*;—*Hypophosphorous Acid* is found effective in pulmonary consumption;—*Idoform* is recommended for its soothing properties in neuralgic disorders, as well as in cases of scrofula, rickets, goitre, and syphilis;—*Iodide of Cadmium* is used for external application in cases of disease;—*Kousso*, an Abyssinian plant, of the natural order Rosaceæ, is found to be a powerful remedy against worms;—*Podophyllin*, a resinous substance, is of great service in biliary fevers, and in all cases where the stomach and liver are affected;—*Quinoidine* has been introduced into practice for the treatment of agues;—and *Sanguinaria Canadensis*, or Canadian Blood-root, is applied as a remedy for cancer.

THER'APHIM: [Teraphim.]

THERMAL SPRINGS (Gr. θερμὸς warm) are those characterized by a higher temperature than the atmosphere where they are situated. They are generally attributable to the action of volcanic agencies, and are frequent in those localities which are or have been the scenes of those agencies; as in the Neapolitan and Roman territories, and in different parts of Asia Minor, where volcanic activity still exists, or is known to have once existed. Sometimes these springs arise from the internal heat of the globe, the combined action of mineral bodies, or the disengagement of subterranean gases powerfully charged with caloric. Many of the thermal springs, however, may be caused by the internal temperature of the globe, which, it is generally admitted, increases in proportion to the distance from the surface. The water, coming from a considerable depth, thus retains its heat until it arrives at the surface of the earth. These springs are common in the Pyrenees and the Alps, and especially in the Grand Duchy of Baden: the town of Baden possessing thirteen warm springs; the principal of which produces 7,500,000 cubic inches of water every twenty-four hours, with a temperature of 153°. The springs of the Alps rise near the bottom of the great chalk formation that covers their northern side. Thus the town of Leak has twelve springs, which vary in their temperature from 117° to 126°. In our own country these thermal springs occur at Matlock and Buxton in Derbyshire, and in the counties of Gloucester and Somerset, which, on account of their sanative properties and the beautiful localities in which they are situated, attract a vast number of fashionable visitors. The heat of the Buxton water reaches 82°, which never varies; and that of Matlock ranges from 66° to 68° Fahrenheit. The thermal springs at Bath range at a higher temperature; that of Cross Bath being 109°; King's Bath 114°, and the Hot Bath 117°. There are some springs that appear to alter considerably in their temperature, and are actually warmer in winter than in summer. These deviations are periodical in some cases, and irregular in others. But what is still more remarkable, we have instances of hot and cold springs being in the immediate vicinity of each other. Mr. Wilkes, the commander of an exploring expedition from the United States, mentions a remarkable instance which he witnessed in one of the islands of the Feejee group. The beach when he landed was steaming with warm water, which oozed through the gravel and sands. There were five springs; one of which was at a temperature of 75°, and another at 200°

to 210°. The waters joined below; and the united streams stood at a temperature of 145°.

THERMOGRAPHY (Gr. θέρμη heat, and γραφή description), the process of producing images in the dark, through the ageney of heat. The very remarkable phenomenon of reproducing prints, medals, &c., on metals, glass, or other substances, by long-continued juxta-position, was first noticed by M. Moser, of Konigsberg, and he then attributed these results to what he called the influence of 'invisible light.' But his views have since been opposed by scientific men, who attributed the phenomena he described to the principle of *heat*, whence the term was derived. Not long ago a French savant, M. Chevreul, contributed a paper to the Académie des Sciences, in which he described some very remarkable results obtained by M. Niepce de Saint-Victor. The substance of this communication was as follows: 'A body having been exposed to light, preserves in the dark some impression of the light.' This problem appears to be proved by this experiment. Expose to the direct rays of the sun, during a quarter of an hour at least, an engraving, which has been kept for many days in obscurity, and of which one half has been covered with an opaque screen; then apply this print to a sheet of very sensitive photographic paper, and keep them in contact for twenty-four hours in the dark. At the end of that time there will be obtained *in black* a reproduction *of the whites* of that part of the engraving which has not been covered by the screen.

THIERRY, JACQUES NICOLAS AUGUSTIN, the French historian, and author of the 'Norman Conquest of England,' was born at Blois, in 1795. After passing through the ordinary routine of education, he became, in 1813, a school teacher. In 1814 he proceeded to Paris, and there joined the Socialists under Count St. Simon; but he soon renounced the connection, and abandoned the fallacious doctrines taught by the Count. He was next appointed one of the editors of the 'Censeur Européen,'—a periodical professing liberal politics; but in 1820 the journal was suppressed. He then devoted his attention to historical pursuits. He had long before formed a theory in his mind of the existence of two distinct races in England—the Norman masters (as he called them), and the Saxon slaves; and in 1825 he brought out his 'Histoire de la Conquête de l'Angleterre par les Normands,' in which he endeavoured to elucidate his preconceived theory of the ever-existing difference of the two races; and, notwithstanding the fallacies there advanced, it is universally admitted to be a work of sterling merit. Among other historical works may be mentioned his 'Letters on the History of France,' (1827); 'Ten Years of Historical Studies,' (1835); 'Collection of Inedited Documents respecting the History of the Tiers-Etat;' 'Récits des Temps Mérovingiens,' &c. In 1853 appeared a collected edition of his entire works. He died in 1856.

THOM, JAMES, celebrated as a self-taught sculptor, was born in Ayrshire, in 1779. He first came into notice from those well-known productions of his chisel, the sandstone statues of Tam O'Shanter and Souter Johnnie, which were soon followed by the statue of 'Old Mortality,' and other works of a similar character. He afterwards proceeded to New York, where he was extensively patronized, and obtained a considerable share of professional employment. He died at New York in 1850.

THOMSON, ANTHONY TODD, M.D., compiler of the 'Conspectus Pharmacopœiæ,' &c., was born at Edinburgh in Jan. 1778, and educated at the High School in that city. He afterwards applied himself sedulously to the study of medicine, and in 1799 became a member of the Royal Medical Society. In 1800 he established himself in London as a general practitioner. In 1810 he brought out his edition of the 'Conspectus Pharmacopœiæ,' and in 1811 appeared his 'London Dispensatory;' both of which works have passed through numerous editions, and been translated into several European languages. He next turned his attention to the study of botany, which he considered of the first importance in the Materia Medica. He gave a series of lectures thereon, and in 1821 issued his first volume on the subject. In 1826 he became a member of the Royal College of Physicians of London; and in 1828 was elected professor of Materia Medica in the London University College. In 1832 he published his 'Elements of Materia Medica,' a work which is still held in high repute among the faculty; and for many years he was editor of the 'Medical Repository.' He died at Ealing in 1849.

THOMSON, THOMAS, M.D., F.R.S., Regius Professor of Chemistry in the University of Glasgow, was born at Crieff, co. Perth, in April 1773. After acquiring the rudiments of education in the parish school of his native town, he was sent to the borough school of Stirling, where he acquired a thorough classical education, to which may be attributed the numerous improvements in the chemical nomenclature now generally in use. He afterwards studied at St. Andrew's and at Edinburgh. He also attended the lectures of the celebrated Dr. Black, from whom he derived his great taste for the study and pursuit of chemistry. In 1796 he succeeded his brother, the Rev. Dr. James Thomson, in the editorship of the Supplement to the third edition of the 'Encyclopædia Britannica,' which position he retained till 1800. His articles on Chemistry, Mineralogy, Vegetable and Animal Substances, &c., are still held in high estimation. It was in the article Mineralogy that he first introduced the use of symbols into chemical science, which are universally acknowledged to be a valuable improvement. In 1800 he began a course of chemical lectures, which were well received; and subsequently, for a period of fifty years, he continued a public lecturer. In 1802 appeared his 'System of Chemistry,' in which he adopted the use of scientific symbols. About this period he invented the oxyhydrogen blow-pipe, and also discovered many new compounds and minerals, as chloride of sulphur, lodalite, allanite, &c. In 1813 he removed to London, and commenced the 'Annals of Philosophy,' which he continued to conduct until 1822. This

journal was afterwards merged in the 'Philosophical Magazine,' which still continues to be published monthly. In 1817 Dr. Thomson was appointed lecturer of chemistry, and afterwards professor, in the University of Glasgow. In 1831 he brought out his 'History of Chemistry,' which may be looked upon as a masterpiece of scientific erudition and elaborate research. In 1835 appeared his 'Outlines of Mineralogy, Geology, and Mineral Analysis;' and in 1849 he published a work on 'Brewing and Distillation.' He died at Kilmun, Argyleshire, in July 1852, aged 79.

THORINA, a primitive earth, of which *Thorium* is the metallic base. It was discovered in 1828 by Berzelius. It constitutes 57·91 per cent. of the mineral *Thorite*, from which it is extracted. Thorina appears as a white powder, without smell, taste, or alkaline properties. The mineral Thorite is massive and compact, and of a dark colour; specific gravity, 4·63. Thorium, like Glucinum, Yttrium, and Zirconium, is a primary element, which appears to exist very sparingly in nature, and is only found in some rare minerals.

THREEPENNY-PIECE, a small silver coin of Great Britain, the fourth part of a shilling. From 1847 to 1856 inclusive, the following amounts were issued:—

1847 . .	4,488	1852 . .	4,488
1848 . .	4,488	1853 . .	36,168
1849 . .	131,208	1854 . .	1,471,734
1850 . .	954,888	1855 . .	387,838
1851 . .	483,553	1856 . .	1,018,248

THRESHING-MACHINES. A variety of implements have of late years been brought into use for the purpose of superseding the tedious and laborious operations of the common flail, and at the same time of reducing the expenses. In the general mode of action these machines nearly all resemble each other. 'The essential part,' says the editor of 'Novelties, Inventions,' &c., 'is a large cylindrical drum, on the outer surface of which are fixed bars or beaters parallel with the axis. The drum is made to revolve with a velocity of five hundred to a thousand turns in a minute. The stalk of corn being passed between feeding rollers, it comes in contact with the beaters on the rapidly-revolving drum. The grain is beaten out, and falls to the ground, while the straw passes on to the other side of the machine. Among our most noted manufacturers, the threshing-machines are usually made from five to nine horse power. Most of the machines are worked by horses, who go round in their monotonous circular course two or three times in a minute. In an average machine about a hundred sheaves of corn can be threshed in three minutes. The revolving drum being the common type of all the machines, minor improvements are introduced by particular makers; one has applied anti-friction wheels to the axle of the drum; another uses serrated instead of plain beaters. Some of the machines are fed with the corn-stalks in a vertical position; some horizontal. In one kind the maker cares only for the complete extrication of the corn from the straw; while in another, which is to be worked near towns, where clean unbroken straw has a good and ready sale, the mechanism is so constructed as to leave the straw in as whole and unbroken a state as possible.'

With regard to the relative expenses of the different machines, and the saving effected, the Exhibition Jury Report of 1851 states, that by the flail method the cost is 3*s.* 5*d.* per quarter; and by the horse threshing-machine, 2*s.*; while by the steam threshing-machine (including all expenses), it only amounts to 9*d.*

THRIFT, the name of a common shrubby plant (*Armeria maritima*), which is a great favourite with horticulturists in the formation of garden borders. It is much esteemed for its pretty flowers, and also for the *thriving* properties it possesses in whatever soil it may be planted; whence it has received its name. [Statica Armeria.]

TICAL, a Chinese weight of about 4½ oz.; and also a money of account, estimated at about the third of a pound sterling. Among the Siamese the tical weight and coin is 236 grains troy; and its value in the currency about 2*s.* 6*d.* (Simmonds' *Dict. of Trade Products.*)

TICKET MACHINE. Among the many ingenious contrivances of the present age, that of rapidly printing consecutive numbers, from 1 to 2000 or more, on cards, account books, bank notes, &c., is one of the most useful and interesting. The invention is attributed to Baranowski, the contriver of the 'Ready Reckoner Machine,' &c. In the mechanism, which is all comprised within a very small space, there is much cleverness and ingenuity. The types are arranged on the circumference of small wheels placed vertically; and on pressing down the frame which contains the wheels, by a sort of piston or plug, the types come in contact with paper or pasteboard placed beneath; but before doing so, the movement causes a tiny inking-roller to work quickly over the face of the types, and thus enables them to print their impress in black ink. If this were all, every ticket would be printed alike; but by means of cogs and notches, and ratchets, the type-wheels make part of a revolution after each impression, so as to present a new figure for the next movement. If the tickets are printed in two colours, there would be two inking-rollers, one for each.

TICKETS OF LEAVE. [Servitude, Penal, *Supplt.*]

TIECK, CHRISTIAN FREDERICK, the celebrated German sculptor, was brother of the poet and novelist Ludwig Tieck (*posted*), and born at Berlin in 1776. In 1805 he went to Italy, and carefully studied the great works of art. While there he met with many influential patrons (among others Madame de Stael, and Ludwig, King of Bavaria), by whom he was employed in the execution of numerous busts. On his return to Berlin, in 1819, he was elected a member of the Academy; and during the rest of his life was employed in most of the public works, especially in the Royal Palace, the Cathedral, and the Theatre Royal. For the Palace he executed a series of marble statues of classical

personages. He also executed the bronze statue of Frederick William at Rappin. For many years he was director of the department of sculpture at the Royal Museum at Berlin; and was there extensively employed in the restoration of ancient works. He died in June 1851.

TIECK, LUDWIG, the eminent German novelist and translator of Shakspeare, was born at Berlin, in 1773. He was educated at Halle, Gottingen, and Erlangen, where he became deeply imbued with the spirit of poetry and history, and especially devoted himself to the romantic literature of the Middle age. As a legendary story-teller Tieck was unrivalled. His productions were numerous. While very young he brought out, in 1792, the tragedy of 'Der Abschied' (The Parting), and in the same year he published a mediæval tale of great interest, entitled 'Das grune Band.' His story of 'Abdallah' was of an oriental cast, and of a terror-striking character. He continued to write a number of novels, tales, and dramatic pieces, which may be said to form the standard works of the light literature of Germany. But Tieck is better known in England from his great knowledge of English literature, especially of the drama. He made a translation, or rather an adaptation, of Ben Jonson's 'Volpone;' and in conjunction with the Schlegels he brought out the best version of Shakspeare's plays which has ever appeared in a German dress. He died at Berlin in April 1853.

TILES (xii. 99). Tiles of a very ornamental character, which can be produced to imitate, in a cheap way, the tessellated pavements of the ancients, are now coming into general use; and among other improvements, the Messrs. Boote, of Burslem, co. Stafford, lately patented a mode of making tiles by a new process, which has been thus described:—A mass of common red brick-clay is beaten into a mould of the required size, and, after the removal of the mould, the oblong block is cut by a series of parallel wires at one process into so many squares of the requisite thickness. A surface coating for the square of finer clay, of the required colour, and about one-sixth of an inch in thickness, is obtained by a similar process; the wires in this case being placed so much closer together. The coating is then placed upon the tile, which is put in a press, upon an iron plate, perforated in the form of the pattern intended to be inlaid. Underneath is a metal die, also in the shape of the design with which the tile is to be decorated. A 'bat' of fine clay, about an eighth of an inch thick, and of the required colour or colours—if the pattern is composed of more than one—is placed upon this die, which is then forced up by powerful mechanical pressure, and inlays the clay into the surface of the quarry above. After a day's drying the squares are scraped, to bring out the clear outline of the pattern; they receive a few days' further drying, and are then ready for the oven.

TIMBER, PRESERVATION OF (xii. 107). Innumerable experiments have been made, at different times, to check the ruinous decomposition of timber, arising from what is usually known as the dry-rot. The rationale of the disease and remedy may be explained in a few words. All trees contain within their pores, or inner cells, a kind of albumen, which contributes to the sustenance of the plant while living; but when the tree is felled, and converted into timber, this albumen becomes an evil, from its having a tendency to enter into a kind of fermentation, and thus encourage the minute insects that perforate the wood in search of the sappy nutriment, which eventually superinduces the ligneous disease called *dry-rot*. Now the object of all experimentalists has been, to discover some chemical agency for protecting timber from the ruinous decay which the internal sap primarily originates. How to get rid of the vegetable albumen was the inquiry and the difficulty. The question naturally arose—What chemical agent should be employed? Corrosive sublimate was suggested by Sir Humphry Davy, which was adopted by Mr. Kyan, under certain modifications. Other chemists gave preference to creosote oil, sulphate of iron and barytes, or chloride of zinc. But, after all, the great difficulty still existed. These solutions could not penetrate the pores, or reach the cells of the wood, unless the air had been previously expelled; and for a long time all the chemical experimenters were completely baffled. At length a very ingenious plan was adopted, and carried into effect, for getting rid of the cellular air. According to this new process the timber is placed in a very strong cylinder, provided with a suction air-pump, and a pressure liquid pump, by means of which the air is pumped out of the pores, and the liquid solution then pumped in. In the method adopted by Messrs. Davison and Symington, known as the *desiccating process*, the pores of the wood are thoroughly dried by means of hot air, assisted by a rapid current. The rationale of this process may be thus explained. If a beam of timber were inclosed in a vessel of stationary hot air, it would be baked; but if a gentle current were admitted, the wood would be stewed; and this baking and stewing are the principles on which the many different modes of drying timber by heated air are founded. By the application of heat, and the agency of a rapid current of air, all the rot-causing moisture of the timber is carried away.

TIN, and TIN TRADE (xii. 119-24). In the year 1857 the exportations of Banca tin underwent a reduction of 39,000 slabs, being 166,000 slabs against 205,000 of the previous year. The reduction was—to England, 24,700; Russia, 13,000; United States, 8000 slabs; and France, 6000 slabs. On the other hand, Germany, Belgium, Austria, and Italy, had taken a little more than in 1856. The total deliveries in Holland, for the year ending June 1, 1858, were 170,980 slabs, against 172,864 slabs in the year ending June 1, 1857; 142,976 in 1856; 129,510 in 1855; 136,600 in 1854; 138,060 in 1853; 147,046 in 1852; and 147,000 in 1851.

TIN-STONE, the oxide of tin, occasionally mixed with small quantities of oxides of manganese, iron, and tantalite. It seems almost translucent, and of a yellowish tint. The constituents

of a specimen from Cornwall were—oxide of tin 99·00; oxide of iron, 0·25; silica, 0·75. Specific gravity 6·4 to 6·9; hardness = 6·0 to 7·0.

TINE'IDÆ (Lat. *tinea* a moth-worm), a family of Lepidopterous insects, or small moths, which are very destructive on account of their depositing their eggs in animal or vegetable matters, upon which they feed. The clothes-moth is destructive to wearing apparel; but the *Tinea granella*, or corn-moth, which attacks corn in granaries, is the greatest enemy of all.

TIPPERARY, County of, Ireland (xii. 129–34). According to the census of 1851, the entire population was 331,487. Of inhabited houses there were 66,384. The area of the county was estimated at 1659 square miles, or 1,061,730 acres, of which 843,887 are arable, 23,479 plantations, 178,183 uncultivated, and 13,523 under water. The population of the principal places was as follows:—

Cahir . . .	3,694	Killenaule . .	2,621
Carrick-on-Suir	6,211	Nenagh . . .	7,349
Cashel . . .	4,798	Roscrea . . .	3,389
Clogheen . .	15,204	Templemore .	4,372
Clonmel . .	15,204	Thurles . . .	5,985
Fethard . .	2,767	Tipperary . .	6,830

TIPU'LIDÆ (Lat. *tipula* a water-spider), a family of Dipterous insects, of which the *Tipula*, or Daddy Long-Legs, is the type. They are classified by naturalists under the order *Nemocera*. The family consists of a variety of species, the principal of which are the *Culiciformes*, the *Florales*, the *Fungivores*, the *Terricoles*, and the *Gallicoles*, which are so named on account of the peculiar characteristics of each.

TOBACCO (xii. 157–61). The quantity imported into the United Kingdom, in 1856, was 44,788,130 lbs., besides two million lbs. of manufactured tobacco and snuff. Of this quantity there was entered for home consumption 32,578,937 lbs. In Paris the consumption of tobacco has more than doubled within a very few years; while that of cigars has been quintupled. It has been calculated that the number of smokers in Paris is about 420,000.

TOLLENS, HENDRIK CORNELISZOON, was born at Rotterdam, in 1780. He was the most popular poet of Holland, and had the distinction of forming a school of poets, called the 'School of Rotterdam.' One of his most popular pieces was a short poem addressed 'To a Fallen Girl,' published in 1807. When the third edition of his poems made its appearance in 1817, it had 10,000 subscribers. In 1850 he received the congratulations of the King of Holland, and the insignia of Commander of the order of the Dutch Lion. He died in 1856.

TONNAGE, a maritime term applied to the weight or internal measurement of a ship, which is presumed to represent the number of tons of cargo the ship will carry. When the tonnage is estimated by the bulk of the vessel, each ton is considered as equal to 40 cubic feet; and there are certain formulæ employed by ship-builders for calculating the amount of tonnage from the length, breadth, and depth of the vessel.

TOOKE, THOMAS, was the son of the Rev. Wm. Tooke (xii. 178), and born in 1773. He is known to political economists as the author of a work which he published in 1838, entitled 'A History of Prices, and of the State of the Circulation, from 1793 to 1837,' which forms the two first volumes of his valuable and more extended work, the 'History of Prices.' He died in 1858, aged 85.

TORQUES (Lat.), a chain or collar of gold or silver, given by the Romans as an especial mark of distinction to those soldiers who had performed some valiant or meritorious deed. They were worn round the neck, and wreathed with great beauty. But these ornaments were not peculiar to the Romans; they were worn not only by the Asiatics, Egyptians, and Greeks, but by the ancient Britons and Gauls. Manlius, the Roman hero, acquired the surname of Torquatus, from the torque which he obtained from a Gaul whom he slew in single combat; and Publius Cornelius took 4070 golden torques, after the slaughter of the Boii. The British heroine Boadicea wore a golden one of unusual size, and Virdomarus had one fastened behind with hooks, which fell off when he was decapitated. Jornandes mentions them as substitutes for diadems. Among the Anglo-Saxons and Normans they were insignia of dukes and earls. One of these pieces of antiquity was found near the castle of Harlech, in Merionethshire, consisting of a wreathed bar, or rather of twisted rods, about four feet long, flexible, but bending entirely one way; it had hooks at each end, not twisted, but plain and cut even. A still more magnificent one was dug up in Staffordshire, so hammered as to be elastic. (Nuttall's *Archæol. Dict.*)

TOYS. The manufacture of children's toys has of late years become a matter of some importance in the commercial world. They are brought in immense numbers from Germany and Switzerland, especially from those hilly districts where the forests supply abundance of timber at very low cost. It appears, however, that the English toy-makers produce the best specimens of the rocking-horse kind, and also the best puzzles; while the Swiss take the lead in models and white wood cottages, and the French in toys of a mechanical or clock-work character. But the Germans appear to surpass all others in well-carved toys, and cheap boxes. The best German toys, says the 'Art Union Journal,' come from the town of Sonneberg, on the south-eastern frontier of the forest of Thuringia. It has a population of 4000 inhabitants, of which the greater part are employed in the trade. The principal toy merchants, numbering about thirty, provide themselves with goods from many hundred different makers of common articles, resident in the town and its vicinity; these again are furnished by the neighbouring villagers with the requisite roughly-prepared articles in wood, which are fitted up, carved, and painted by the makers in the town. Every year about 25,000 cwts. of these goods are exported to almost every part of the world; but the manufacturers are confined to the use of wood or pasteboard, or these two materials combined.

The factory, from which the best toys are derived, is that of Adolph Fleischmann, who employs none but first-rate workmen; and it is interesting to notice the many admirable productions these uneducated artists produce—models and groupings of figures that would cast no discredit on the atelier of a Baily or a Westmacott.'

TRACHEA'RIA (Gr. τραχηλος the neck), in zoology, an order of the class *Arachnides*, according to the division of Cuvier. This order differs from the *Pulmonariæ* in their organs of respiration, which consist of radiated tracheæ receiving air through two stigmata. It includes the different forms of shepherd and sea-spiders, ticks, mites, &c.

TRADE, COMMERCE, and NATIONAL REVENUE. [Exports and Imports, Customs, Currency, Coinage, Revenue, Shipping, Tariff, Taxes, &c., *Supplt.*]

The official returns for 1857 will convey a tolerably correct idea of the trading prosperity of this country, and the progressive increase of our exports. In the first nine months of the year 1857, our exports amounted to 95,735,000*l.*; in the corresponding period of 1856 to 84,906,000*l.*; and in that of 1855 to 69,226,000*l.* The increase of 1857 over 1856 is, therefore, for the month, 852,000*l.*; for nine months, 10,829,000*l.*; while its increase over 1855 is, for the month, 1,996,000*l.*, and for nine months, 26,509,000*l.* The total declared value of articles of British produce exported in the month of September 1857, was 11,068,000*l.*, as compared with 10,216,000*l.* in the same month of 1856, and with 9,072,000*l.* in that of 1855.

The annual average of shipping, entered at the ports of the United Kingdom, from 1854 to 1858, was 10,220,528 tons, the percentage of the British to the total shipping being 68. The increase of 1854–58 over 1448–48 was equivalent to 65 per cent., and that of 1844–48 over 1834–38 to 76. The annual average of the total value of exports of the produce of the United Kingdom from 1854 to 1858 was 109,493,865*l.*, against 57,624,897*l.* and 46,898,431*l.* in the quadrennial periods 1844–48 and 1834–38 respectively. In 1858, 6,439,201 tons of British and 4,522,499 tons of foreign shipping entered inwards, and 6,452,204 tons of British and of foreign cleared outwards from ports of the United Kingdom. The tonnage of British shipping engaged in trade with the colonies was 1,758,421 (entered) and 2,053,232 (cleared), and the tonnage of foreign shipping so employed, 285,348 (entered) and 399,820 (cleared).

Of the general trade and commerce of the country, for 1858, and the immense revenue thence derived, something like a just estimate may be formed from the following returns of our national income and expenditure made up to the 31st of December 1858. From this it appears that the public income of the United Kingdom amounted to 66,286,995*l.*, and the expenditure to 65,159,338*l.*, leaving a balance of income amounting to 1,127,657*l.* The balances in the Exchequer at the end of the year were 7,755,455*l.* The following are the items of the income of 1858:—Customs, 24,091,999*l.*; Excise, 17,966,000*l.*; stamps, 7,996,342*l.*; taxes (land and assessed), 3,158,033*l.*; income-tax (inaccurately styled 'property tax'), 7,591,187*l.*; Post-office, 3,075,000*l.*; and Crown lands, 277,440*l.* The items of expenditure are:—Interest and management of the public debt, 28,501,479*l.*; the charges on the Consolidated Fund, 1,832,576*l.*; and the supply services, 34,575,282*l.* The Army (in this last item) figures for 12,588,736*l.* (including Commissariat, Ordnance, and Militia charges); the Navy (including packet service, transports, &c.), for 9,637,103*l.*; Miscellaneous Civil Services, for 7,253,059*l.*; the salaries of Revenue Departments, for 4,474,440*l.*; the China Naval and Military operations, for 391,943*l.*; and the war expenses (Russia), for 230,000*l.* The Civil List costs the country 406,871*l.*; annuities and pensions, 339,405*l.*; salaries, &c., 158,060*l*; diplomatic salaries, &c., 162,638*l.*; and courts of justice, &c., 598,885*l.*

From an official return of the first two months of 1859 it appears that in some articles of trade and commerce there has been a decline. Thus, pig iron has fallen off 28,457 to 27,496 tons; while the export of coal and coke shows a falling-off from 722,769 to 703,489 tons. Our best customer continues to be France, which has taken this year 189,004 tons (an increase over 1858). Spain has taken 80,618 tons; Turkey, 49,268 tons; the Hanse Towns, 31,648 tons; the United States, 20,858 tons; Denmark, 16,787 tons; Malta, 17,646 tons; and the British West Indies, 12,926 tons. In bar, bolt, and roll iron, there has been an increase from 25,998 to 41,422 tons. Wire iron has increased from 1,162 to 1,682 tons; railway iron, from 44,113 to 47,189 tons; wrought iron of all kinds (exclusive of railway iron), from 17,065 to 24,837 tons; and unwrought steel, from 1,322 to 2,913 tons; but cast-iron has fallen off from 10,067 to 8,884 tons. Steam engines show a decline from 158,868*l.* to 88,670*l.*; but other sorts of machinery have only fallen off from 287,912*l.* to 269,531*l.*

TRADE, BOARD OF. [Boards, Ships, and Shipping, *Supplt.*] The jurisdiction of the Board of Trade has been greatly enlarged within the last few years. It not only extends to matters of shipping, but by Stat. 17 and 18 Vict. c. 104, it also exercises a general supervision over all railways and railway companies, as transferred to the Board in 1851, by Stat. 14 and 15 Vict. c. 64; and this to such an extent that no railway bill can be introduced into Parliament without due notice being given to the Board; nor can any new line be opened unless its permission is previously obtained. By Stat. 19 and 20 Vict. c. 47, the Board is charged with the registration of all joint-stock companies; and the various schools of design, now established in different parts of the country, are under its cognizance.

TRADES, PROFESSIONS, AND OCCUPATIONS OF THE PEOPLE. The census of 1851 has recorded many important statistical details of the state of our national industry. We there find that the number of persons with no occupation is exceedingly small. Of persons of rank and property, above 21 years of age, who

are not referred to any office or occupation, 10,604 were returned as gentlemen, or men of independent means, and 15,318 as gentlemen: 23,032 men and 121,222 women were annuitants. Of 157,402 persons, including many women and children, no further information was afforded than that they were chiefly supported by members of the community, as dependent relatives, pensioners, paupers, or vagrants. The ratio of those employed in the mechanical arts, trade, and domestic service, was 29·9 per cent. (England and Wales alone); those employed in agriculture, 17·0 per cent.; those employed in manufactures, 8·5; and those employed in mining and mineral works, 6·5 per cent. Throughout the whole kingdom the percentage was—mechanical arts, trade, &c., 45·0; agriculture, 4·6; manufactures, 6·5; and mining, 6·3 per cent. But according to a more recent return, ordered to be printed by the House of Commons, it appears that of the persons 20 years old and upwards, 31 per cent. are occupied in trade and mechanical arts, and domestic service; 16·1 per cent. in agriculture; 8·4 in manufactures; and 6·3 in mining and mineral works. The agriculturists preponderate in the south-eastern, the south-midland, the eastern, the south-western, the north-midland, and the Welsh division; while manufactures have the ascendancy in the north-western and York districts.

At a late meeting of the Statistical Society a paper was read by Mr. Welton, 'On the Occupations of the People of England and Wales;' in which he divided the people into nine classes, the numbers in each of which are as follow:—1. Agricultural, Grazing, Fishing, &c., 2,039,402; 2. Mining, Quarrying, &c., 297,184; 3. Manufacturing, 1,458,699; 4. Trading, 2,499,880; 5. Commercial, 602,605; 6. Menial, 1,006,452; 7. Professional (except Legal), 172,855; 8. Official and Legal, 173,911; 9. Unclassified, 9,676,621; total, 17,927,609. Class 4 consists mainly of shopkeepers, and workmen employed in manufactures for local use; and class 5 includes those who are employed in the maintenance of roads, railways, and canals, and in the carriage of goods.

The following alphabetical tables present a concise view of the various Trades and Occupations of Great Britain employing more than 10,000 persons, and demonstrating, at the same time, the relative importance of the respective Occupations, so far as numbers are concerned:—

Trades and Occupations employing more than 50,000 persons, alphabetically arranged.

Agricultural labourers, farm-servants, and shepherds	1,460,896
Army and navy	178,773
Bakers	62,472
Blacksmiths	112,776
Boot and shoe makers	274,451
Bricklayers	67,939
Butchers and meat salesmen	67,691
Carmen, carriers, carters, and draymen	56,981
Carpenters and joiners	182,696
Charwomen	55,423
Coal-miners	219,015
Cotton and calico manufacturers (printing and dyeing)	501,465
Domestic servants	1,038,791
Farmers and graziers	306,767
Gardeners	80,946
Grocers	85,913
Hose (stocking) manufacturers	65,499
Innkeepers, licensed victuallers, beer-shop keepers	75,721
Iron manufacturers, moulders, and founders	80,032
Labourers (branches undefined)	376,551
Lace manufacturers	63,660
Linen and flax manufacturers	98,860
Masons and paviors	101,442
Messengers, porters, and errand boys	101,425
Milliners and dressmakers	267,791
Plumbers, painters, and glaziers	62,808
Schoolmasters and mistresses	65,376
Seamen (merchant service) on shore in British ports	89,206
Seamstresses and shirt-makers	73,068
Silk manufacturers	114,570
Tailors	152,672
Washerwomen, manglers, and laundry-keepers	146,091
Woollen cloth manufacturers	137,814
Worsted manufacturers	104,061

Trades and Occupations employing less than 50,000, and more than 20,000.

Boat and barge men and women	37,683
Brickmakers and dealers	31,168
Cabinet-makers and upholsterers	40,897
Commercial clerks	43,760
Coopers	20,245
Copper miners	22,386
Drapers (linen and woollen)	49,184
Earthenware manufacturers	36,512
Engine and machine makers	48,082
Fishermen and women	38,294
Glovers	29,882
Government civil service	30,963
Hawkers and pedlars	30,553
Horsekeepers, grooms (not domestic), and jockeys	29,408
Iron miners	28,088
Lead miners	22,530
Lodging-house keepers	23,089
Millers	37,268
Nail manufacturers	28,533
Nurses (not domestic servants)	25,518
Printers	23,024
Railway labourers	34,306
Sawyers	35,443
Shipwrights and shipbuilders	25,201
Shopkeepers (branches undefined)	29,800
Straw-hat and bonnet makers	21,902
Straw-plait manufacturers	32,062
Stone quarriers	23,489
Teachers (various), and governesses	40,575
Wheelwrights	30,244

Trades and Occupations employing less than 20,000, and more than 10,000.

Brass-founders, moulders, and manufacturers	11,230

Brewers	18,620
Bookbinders	10,953
Builders	12,818
Carpet and rug manufacturers	11,457
Clergymen of Established Church	13,587
Coachmakers	16,590
Coachmen (not domestic servants), guards, and postboys	16,836
Coalheavers and coal-labourers	14,426
Coal-merchants and dealers	12,092
Confectioners	13,865
Cowkeepers and milk-sellers	16,526
Curriers	12,920
Dock labourers, dock and harbour service	18,462
Druggists	15,643
Dyers, scourers, and calenderers	12,964
Farm bailiffs	12,805
Fishmongers	10,439
Glass manufacturers	12,005
Goldsmiths and silversmiths	11,242
Greengrocers and fruiterers	14,320
Hair-dressers and wig-makers	12,173
Hatters and hat manufacturers	16,975
Law clerks	16,626
Maltsters	11,150
Merchants	10,256
Muslin manufacturers	14,098
Paper manufacturers	14,501
Plasterers	17,980
Policemen	18,348
Protestant (Dissenting) ministers	9,644
Railway officers, clerks, and station masters	10,948
Ribbon manufacturers	10,074
Road labourers	10,923
Rope-makers	15,966
Saddlers and harness-makers	17,583
Solicitors, attorneys, and writers to the Signet	13,256
Staymakers	13,699
Surgeons and apothecaries	15,163
Tin miners	15,050
Tinmen, tinkers, and tin-plate workers	13,770
Warehousemen and women	17,861
Watch and clock makers	19,159
Wine and spirit merchants	10,467

Trades and Occupations to which Licences were granted for the Year 1858, *and the Revenues thence derived:* — (alphabetically arranged, from the Parliamentary Returns of May 3, 1859.)

Auctioneers, in England and Wales, 3581; Scotland, 425; Ireland, 352. Cost of licences, 43,580*l.*

Beer, Cider, and Perry, dealers in, in England and Wales, 108,804; Scotland, 383; Ireland, 18,165. Cost, 304,688*l.* 9*s.* 2*d.*

Brewers, in England and Wales, 40,418; Scotland, 259; Ireland, 117. Cost, 81,029*l.* 16*s.* 2*d.*

Distillers, in England and Wales, 22; Scotland, 130; Ireland, 37. Cost, 1963*l.* 10*s.*

Hackney Carriage proprietors, in London, 5475. Cost, 5474*l.*

Malt, Roasted, dealers in, England and Wales, 21; Scotland, 1; Ireland, 22. Cost, 210*l.*

Malt Roasters, in England and Wales, 12; Scotland, 2; Ireland, 9. Cost, 445*l.*

Maltsters, in England and Wales, 6157; Scotland, 648; Ireland, 161. Cost, 18,636*l.* 16*s.* 2*d.*

Paper-makers, in England and Wales, 326; Scotland, 54; Ireland, 17. Cost, 1642*l.* 4*s.*

Postmasters, in England and Wales, 24,743; Scotland, 2,522; Ireland, 1982. Cost, 137,496*l.* 12*s.* 5*d.*

Rectifiers, in England and Wales, 99; Scotland, 10; Ireland, 48. Cost, 1588*l.* 2*s.* 6*d.*

Retailers of Liquors or Tobacco on board passenger vessels, in England and Wales, 234; Scotland, 86; Ireland, 45. Cost, 383*l.* 5*s.*

Soap-makers, in England and Wales, 204; Scotland, 26; Ireland, 139. Cost, 1505*l.* 14*s.*

Spirit dealers, in England and Wales, 62,255; Scotland, 12,368; Ireland, 18,313. Cost, 560,557*l.* 12*s.* 4*d.*

Stage-coach proprietors, in England and Wales, 7013; Scotland, 617. Cost, 10,695*l.* 4*s.*

Stills, makers of, in Scotland, 38; Ireland, 4. Cost, 22*l.* 1*s.*

Stills for the use of chemists, in England and Wales, 182; Scotland, 16; Ireland, 21. Cost, 111*l.* 0*s.* 7*d.*

Sweets, retailers of, in England and Wales, 9655; Scotland, 119; Ireland, 122. Cost, 10,412*l.* 2*s.* 11*d.*

Tea-dealers, in England and Wales, 114,319; Scotland, 17,582; Ireland, 20,074. Cost, 84,663*l.* 11*s.* 9*d.*

Tobacco manufacturers and dealers, in England and Wales, 212,950; Scotland, 18,660; Ireland, 20,438. Cost, 70,887*l.* 14*s.* 7*d.*

Vinegar-makers, in England and Wales, 61; Scotland, 7; Ireland, 1. Cost, 345*l.* 3*s.* 9*d.*

Wine-dealers, in England and Wales, 27,446; Scotland, 86; Ireland, 45. Cost, 88,765*l.* 7*s.*

The total number of licences, granted in the year, yielded a revenue to the national exchequer of 1,425,102*l.* 7*s.* 4*d.*

TRAJAN'S PILLAR, a distinguished work of art, executed by Apollodorus of Athens, which formerly stood in the centre of the Roman forum, and still remains as an historical record of Trajan's reign, and one of the finest specimens of artistic skill. It was erected by the Emperor Trajan, A.D. 114, to commemorate his victories over the Dacians; and it is entirely surrounded with bas-reliefs of his exploits, amounting to about 2000 heads. The figures have very little relief. Those at the bottom of the column are two feet higher; and those at the top appear of the same size, because the artist made allowance for the laws of perspective, and enlarged the figures in proportion as they approached the summit. The pillar is built of white marble; and its base, which consists of twelve enormous-sized stones, is raised on a socle, or foot of eight steps; and in the interior is a staircase, which receives its light from forty-four windows. Its height is 144 feet; and its sculptured ornaments are considered superior to those of the Antonine column, which is 35 feet higher.

TRANSPORTATION. By stat. 20 and 21

Vict. c. 3, this punishment was abolished, and the sentence of penal servitude substituted. [SERVITUDE, PENAL, *Supplt.*]

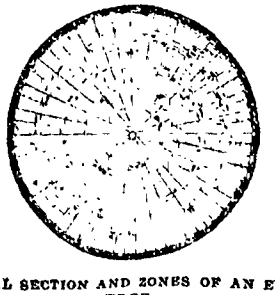
TREES (xii. 257). From the remotest periods of antiquity, Trees, as the most majestic forms of vegetable creation, have constituted the wild grandeur of the forest, or the picturesque adornments of the landscape. Each portion of the earth, says Humboldt, has its peculiar beauty. 'To the tropics belong diversity and grandeur in the forms of plants. As in the *Musaceæ* we have the widest expansion, so in the *Casuarinæ* and the needle-tree we have the greatest contraction of the leaf-vessels. Firs, thujæ, and cypresses constitute a northern flora, which is very uncommon in the plains of the tropics. Their ever-verdant green enlivens the dreary winter landscape, and proclaims to the inhabitants of the north, that even when snow and ice have covered the ground, the inner life of vegetation, like Promethean fire, is never extinguished on our planet.'

In all ages trees have called forth the enthusiasm of the poet and historian, the admiration of the artist, and the researches of the naturalist. In the first ages umbrageous woods and groves, as sung by the poets, were resorted to as temples; and particular trees were supposed to be the residence of certain divinities. Thus in the venerable oak the Dryades and Hamadryades were presumed to be enshrined; and the Gods are said to have taken particular species of trees under their protection. The mighty Zeus, or Jupiter, adopted the oak as the emblem of strength; Hercules, the poplar; Apollo, the laurel; Venus, the myrtle; Minerva, the olive; Bacchus, the ivy and the vine; and Cybele, the pine tree. The Greek historians have handed down to us many glowing accounts of the sylvan beauties of the eastern climes. Diodorus relates that Semiramis, the great Eastern queen, caused her grounds and spacious gardens, at the foot of Mount Bagistanos, to be laid out with all the finest trees that Asia could produce; while the parks of the Persian monarchs were adorned with cypresses whose obelisk-like forms resembled flames of fire; and, on that account, after the appearance of Zoroaster, they were planted around the sacred precincts of the Temple of Fire. Pausanias also mentions with admiration the grove round the Temple of Apollo at Grynion Æolis; and in the celebrated chorus of Sophocles the grove of Colonus is commemorated.

The magnitude and longevity of trees have ever been subjects of great interest to the naturalist, and more especially to the physiological botanist. [CEDARS, CYPRESSES, &c., *Supplt.*]

Under the article CALIFORNIA will be found some interesting notices of the mammoth trees of the Sierra Nevada, which, for antiquity and size, surpass all the vegetable productions of the known world. These trees are evergreen and coniferous; and the one now exhibited at the Sydenham Palace has been designated the *Wellingtonea gigantea.* [*Supplt.*, p. 215.] It is related that in Tasmania there is a mammoth *Encalyphus*, or Gum tree, standing at the foot of Mount Wellington, near Hobarton, which is 84 feet in circumference at the base, or a diameter of about 28 feet, and its height has been estimated at 330 feet. But this is 'a mere pigmy,' says a contemporary writer, 'when compared to the forest monarchs which grow on the slopes of the Sierra Nevada, in California, about 5000 feet above the level of the sea. These Californian monsters are of the same genus, though perhaps not of the exact species, as the ancient cedars of Lebanon. The California grove is in about the same latitude, the same altitude above the sea, and has the same climate as those mighty forests of the mountains of Lebanon from which King Hiram supplied the timber for building Solomon's Temple. Of those Lebanon forests, only some half-dozen gnarled and shattered relics now remain, near the summit of that lofty range; while in California we have a grove of the most magnificent specimens, coeval with Solomon and David. There they have stood, and have continued to grow, while kingdoms, empires, and dynasties have risen and disappeared; and there they stand, the living patriarchs of 3000 years!'.

Judging from the concentric rings or layers deposited by the sap, which furnish a good chronicle of the age of many trees, these giant productions of the vegetable creation appear to average from 3000 to 4000 years. Two of them would, therefore, span the entire period of recorded time, from the days of Adam to the present period! The means by which the ages of trees are thus ascertained are either historical or botanical. In the first place we judge from ascertained data; and in the second, by the number of circular zones. In Exogenous trees (or those in which the woody matter is annually increased by additions to the outside) the stem generally presents a series of zones, and each zone has been usually found to correspond with one annual period of vegetation. [EXOGENS.] Hence, by counting the number of zones in the trunk of an exogenous tree, from the centre pith to the outer bark, the botanist is enabled to estimate the number of years it has existed; as illustrated by the annexed diagram of the horizontal section of the trunk of an exogenous tree, at the end of the fifth year.



HORIZONTAL SECTION AND ZONES OF AN EXOGENOUS TREE.

In the above section are represented the central core, and the five zones or concentric rings of wood, with the bark, the cambium, and the medullary rays.

When the tree is sound there is little difficulty in counting the zones, and ascertaining its age.

The plan adopted by Adanson, in calculating the vast ages of the Baobabs of Africa, was first to take a square inch, and count the zones contained therein; then to multiply the number of zones by the number of inches from the pith to the bark, which gave the entire number of zones, and the exact age of the tree. The same method is usually employed in calculating the ages of other gigantic trees; among which may be enumerated the following, with the periods of their respective ages:—

	Years old.
Palms	300
Cherodendron	327
Ulmus (Elm)	355
Cupressus (Cypress)	388
Hedera (Ivy)	448
Acer (Maple)	516
Larix (Larch)	576
Castanea (Chestnut)	626
Citrus (Lemon, Orange, &c.)	509, 640
Platanus (Plane)	720
Cedrus (Cedar)	800
Juglans (Walnut)	900
Tilia (Lime)	530, 800, 825, 1076
Abies (Spruce)	1200
Quercus (Oak)	800, 860, 1000, 1600
Olea (Olive)	1000, 2000
Taxus (Yew)	1214, 1466, 2588, 2880
Schubertia (Taxodium)	3000, 4000
Leguminosæ	2052, 4104
Adansonia (Baobab)	5000
Dracæna (Dragon Tree)	5000

TRIBUNES OF THE PEOPLE (Lat. *Tribunal*, a seat of judgment), among the Romans, certain magistrates elected from the plebeians, to defend the rights and liberties of the people against the encroachments of the Patricians. In the first instance two only were selected. Afterwards they were increased to five; but in the year 297 U.C., they were augmented to ten, which number remained ever afterwards. At first they confined themselves to the redress of popular grievances, and preserving the liberties of the people; but being supported by the great body of plebeians, they eventually exercised a despotic power. They issued decrees, assembled the populace, made laws, and executed them upon the magistrates, sometimes sending the very consuls themselves to prison. They had a veto upon all legislative proceedings, and an absolute control over the senate. But at length their power was effectually annihilated under the emperors, who compelled the people to confer upon themselves the same power that the tribunes had enjoyed.

The *Military Tribunes* of Rome were certain officers who commanded in chief over a large body of troops. At first they were elected by the kings, then by the consuls, and eventually by the people themselves. Their business was to decide controversies in the army, to give the word to the watch, and to take care of the camp and its works. They were called Tribunes, because, at their institution under Romulus, they were three in number, elected from the three tribes; but they were afterwards increased to six in every legion. There were other officers among the Romans called Tribunes, as the *Tribunes of the Soldiers*, *Tribunes of the Treasury*, *Tribunes of the Prætorian Cohorts*, &c.

TRICHIURI'NÆ (Gr. θρίξ hair, and οὐρὰ a tail), in ichthyology, a sub-family of the *Coryphænidæ*, of which the *Trichiuris*, or Hairy-tail, is the type. The body is linear and narrow; jaws long; teeth large and acute; and the ventral fins and finlets wanting.

TRICHOP'TERA (Gr. θρίξ hair, and πτερὸν a wing), the Case-flies, an order of insects, according to Kirby, bearing a close resemblance to the Lepidoptera; their wings being covered with minute scales or hairs; whence the adoption of the name.

TRIONY'CIDÆ (Gr. τρεῖς three, and ὄνυξ a claw), a family of Tortoises, of which the genus *Trionyx* is the type. It consists of two genera, the *Trionyx* and the *Emyda*. It is characterized by palmated feet, and three claws on each foot. The carapace, or shell, is covered with a soft skin, which is expanded before the eye; and hence the family have received the designation of Soft Tortoises.

TRIPLE-TIME, in music, a time consisting of three measures in a bar; the two first of which are beat with the falling of the hand or foot; and the third marked by its elevation. There were formerly in use no less than six different triple measures. But at the present time we only employ three different triples; those of three minims, of three crotchets, and of three quavers. (Busby's *Mus. Dicty.*)

TROG'LODYTES (Gr. dwellers in caverns, from τρώγλη a cavern), a sub-genus of *Quadrumana*, natives of Western Africa. [APES, and CHIMPANSEE, i. 879–82.] Of all the Simia tribe this appears to approach the nearest to the genus *Homo*; and by the general consent of living naturalists is placed next to man in the zoological classification. In the British Museum, however, there is a recently-imported specimen still more nearly approaching to the human characteristics, which naturalists have designated the *Troglodytes Gorilla*; but more popularly called 'The Hairy Man of the Woods.' It is presumed to be the first of the species which has ever been brought to England. It was sent from Gaboon, on the western coast of Africa, and restored by Mr. Bartlett, the naturalist of the Sydenham Palace Exhibition. The specimen at the British Museum is a young male, as appears from the state of his teeth, and from the cranial sutures. There was considerable difficulty in catching him; and Mr. Bartlett discovered several bullet-wounds in his body.

In a lecture delivered by Professor Owen, before the Royal Zoological Society, some interesting details were mentioned as to the history and habits of this remarkable specimen of the Simia tribe. He places the Gorilla as an animal between the Chimpanzee (*Troglodytes niger*) and the negro race of man. The adult male measures, from the crown of the head to the sole of the foot, five feet six inches, which is the average height of the generality of men. The width

across the shoulders is nearly three feet, and the length of the head and trunk three feet six inches. The extent of the arm, or upper limb, as here exhibited, is three feet four inches; while that of the leg, or lower limb, which is without any calf, is two feet four inches.

TROGLODYTES GORILLA
(*From the British Museum.*)

Professor Owen, in his lecture, called particular attention to the shortness or rather absence of the neck, to the narrowness and lowness of the brain-case; and the prominence of the eye and the frontal sinus; all of which impart a repulsive aspect to the general physiognomy. Its nose is more prominent than in the Orang-utang, or the Chimpanzee, and its mouth and lips very large. The shoulders are wide across, and the chest of great capacity. The abdomen is prominent, the pelvis somewhat broader than in other animals of the Simia tribe. The principal deviations from the human structure are in the great strength and power of the limbs, especially the upper ones, as seen in the annexed representation; and the hand is remarkable for its thickness and width, and the great length of the palm.

TROJAN WAR, a celebrated epoch in classical history, which occurred about thirteen centuries before the Christian era. It was undertaken by the Grecian States to recover Helen, wife of Menelaus, who had been carried away by Paris, son of Priam, King of Troy. This event has formed the subject of two of the finest poems in the world,—Homer's 'Iliad,' and Virgil's 'Æneid.'

TRURO, RIGHT HON. THOMAS WILDE, BARON, was the eldest son of Mr. T. Wilde, attorney, of College Hill, London, and born in July 1782. He was educated at St. Paul's School. Having been articled to his father, for some years he practised as an attorney; but in 1817 he was called to the bar at the Inner Temple; and his practice soon became considerable. In 1820 he was engaged as one of the counsel for Queen Caroline on her trial in the House of Lords. In 1824 he became a serjeant-at-law; and in 1827, a King's Counsel. He was returned as a member of Parliament in 1831, for the borough of Newark. In December 1839 Mr. Wilde became solicitor-general, and received the honour of knighthood. In 1841 he was advanced to the position of attorney-general, and during the same year was returned as member for the city of Worcester. Under Lord John Russell's administration, in 1846, he was appointed Lord Chief Justice of the Common Pleas, and sworn a member of Her Majesty's Privy Council. In 1850 he was made Lord Chancellor, and created a peer of the realm, by the title of Baron Truro, of Bowes Manor, co. Middlesex, which exalted office he filled up to February 1852, when the Earl of Derby succeeded to the head of the government. He died in November 1855.

The name of Lord Truro is associated with many useful reforms in the administration of the laws. Among other things he appointed a commission to inquire into the jurisdiction, pleading, and practice of the Court of Chancery, and by his recommendation the services of the twelve masters were dispensed with, and a saving of 20,000*l.* per annum effected. The enormous fees of the Chancery Court and several useless offices were likewise abolished. Lord Truro was also instrumental in establishing the Court of Lords Justices, by which the judicial labours of the Lord Chancellor were materially relieved; and to him we owe the reform of the procedure in the courts of common law, a measure which has been fully appreciated by the public.

TRUSTS and TRUSTEES (xii. 330). By the stat. 20 and 21 Vict. c. 54 (1857), breaches of trust, or defalcations on the part of trustees, bankers, merchants, attorneys, brokers, or agents, are made a misdemeanor, punishable with imprisonment for two years, or penal servitude for three. According to this Act any director or manager of a public company, improperly disposing of the funds under his control, or publishing false statements with fraudulent intent, or any person entrusted with a power of attorney fraudulently transferring it, shall be treated as a misdemeanist, and punished as above stated. With regard to Charitable Trusts, an Act was passed in 1853, for securing their better administration. A permanent board of commissioners was then constituted, called 'The Charity Commissioners for England and Wales,' with power to call upon all trustees of charities to render their accounts in writing to the inspectors of the board. Where the income of a charity does not exceed 30*l.*, jurisdiction, in litigated matters, is given to the county court where the charity is situated. The commissioners are bound to lay a report of their proceedings every year before Parliament. Thus an effectual check has been given to the system of fraud which has so frequently disgraced the managers of public trusts, and often entailed the ruin of thousands.

TULARE LAKE. [CALIFORNIA, *Supplt.*]

TURKEY (xii. 358-65). This once powerful empire has been rapidly on the wane during the last and present century; and Russia, with an eagle eye, has been long watching her opportunity to pounce upon her prostrate victim. If we draw a comparison between the past and present positions of the Russian and Turkish empires, the contrast is remarkable, and presents a most potent lesson to the ethnological inquirer. While the once barbarous denizens of the mountain streams of the Don and the Wolga have been gradually emerging from obscurity, and have at length become sufficiently powerful to threaten

even the very existence of their once powerful neighbours, the descendants of Othman and Solyman, who for ages possessed absolute sway over the finest regions of the globe, have been rapidly sinking into insignificance. The reign of Solyman 'the Magnificent,' who was contemporary with Henry VIII. of England, Francis I. of France, and Charles V. of Spain, was the zenith of Turkish glory; and forms the most brilliant epoch of Ottoman history. But the naval battle of Lepanto (1570), in which the Turks were signally defeated by the Spaniards and Venetians, was the first fatal blow to Ottoman domination on the seas. In 1716 and 1717 the Turks were again defeated in several battles by the Austrians, and compelled to conclude the treaty of Passarowitz, which was considered so humiliating to the Ottoman pride, as to cause the deposition of the reigning sovereign. Since that period the Turks have sustained many signal reverses. On one side they have been defeated by Kouli Khan of Persia, and on the other hand by the Russians, to whom they have been compelled to cede, at different times, many extensive tracts of territory. Independently of these defeats, the rebellions in the Turkish dominions have been numerous and formidable. In 1820 the Greeks rebelled, and eventually effected their independence. But one of the most important events in the domestic history of Turkey was the destruction, in 1825, of the formidable corps of Janissaries, who, during her successful career, had often led her martial sons to victory. For ages they had formed the standing militia of the country. Their origin dated from the reign of Murad I., who established this body from the captives taken during the conquests of Albania, Bosnia, Servia, and Bulgaria. From their numbers and union they at length became formidable to the government; and repeatedly mutinied against their sultans. They even dethroned Selim; and in the beginning of the reign of the late sultan Mahmoud they broke out, in consequence of attempted innovations in the discipline of the army, into a dreadful insurrection, which lasted three days. At last the sultan, having gained the co-operation of their Aga, or chief, resolved to abolish them; and on their offering resistance to the orders of their government, a general and successful attack was made upon them, when 25,000 men are said to have perished, and the entire force was annihilated.

In 1838 the Bulgarians revolted; and in 1840 the Bosnians. The defeat of the Turks by Ibrahim Pacha of Egypt, in 1840, has been already noticed (xii. 865). In 1848–50 the Moldavians and Wallachians, and in 1853 the Montenegrins revolted against Ottoman rule. In the mean time Russia had not been an idle spectator of the declining strength of the Ottoman power; and in 1853 she conceived that the opportunity had arisen for taking advantage of her weakness. She then sought a cause of quarrel, by taking possession of the Danubian provinces under the pretext of obtaining guarantees for the protection of Turkish subjects professing the Greek religion, of which the Czar assumed to be the head. Many angry notes were exchanged, and war was declared by Turkey. But her fate, in all probability, would soon have been sealed, had it not been for the intervention of England and France, who, after the destruction of the Turkish fleet at Sinope, entered the Black Sea, and eventually declared war against Russia. The struggle was fearful; but it finally terminated in favour of the allied armies by the capture of Sebastopol, and the treaty of Paris in March 1856. [RUSSIA; CRIMEA; SEBASTOPOL, *Supplt.*]

Since the termination of the above struggle, the sultan has introduced many reforms for the purpose of ameliorating the wretched institutions of the country; and especially as regards the freedom of Christian worship. According to recent accounts, above one hundred Christian churches have been constructed or repaired. To one building in the Isle of Candia the sultan alone contributed 25,000 francs.

The population of the Turkish empire is very difficult to estimate correctly; but if the returns we possess can be relied on, it has been of late years on the wane. In vol. xii. p. 359, it is given at 37,000,000; whereas later estimates have returned the population as follows:—

In Europe	15,500,000
In Asia	16,050,000
In Africa	3,800,000
	35,350,000

This population may be thus classified under the principal religious denominations of the empire, in Europe, Asia, and Africa:—

Mussulmans	21,000,000
Greek church	13,000,000
Catholics	900,000
Jews	150,000
Different sects	300,000
	35,350,000

Of these different sects, the great bulk are Mussulmans, of which there are 12,650,000 in Asia; 4,550,000 in Europe, and 3,800,000 in Africa. The next in proportion are the Greek church, of which there are 10,000,000 in Europe, and 3,000,000 in Asia.

TURNER, JOSEPH MALLORD WILLIAM, the celebrated landscape-painter, was the son of a hair-dresser, of Covent Garden, London, and born in 1775. Evincing a very early taste for the higher walks of pictorial art, he entered the Royal Academy as a student in 1789, having previously exhibited his two first drawings—'Dover Castle,' and 'Wanstead House.' In 1790, a year after his admission to the Academy, he exhibited a 'View of the Archbishops' Palace, Lambeth,' which did not fail to attract public attention; and from this period to the time of his death he contributed every year, with only three exceptions, to the annual exhibitions of the Royal Academy. The number of his pictures, some of them of considerable magnitude and pictorial beauty, amounted to 259. For many years he chiefly devoted his pencil to water-colour drawings; and in 1802 he gave an illustration of the

extended range his versatile genius was taking, by the exhibition of various subjects representing the different scenes of his travels through Scotland, France, Switzerland, &c. His contributions were The Falls of the Clyde, Edinburgh from the Water of Leith, Ben Lomond Mountains, Kilchurn Castle, The Traveller, Jason, The Tenth Plague of Egypt, Fishermen upon a Sea-shore in squally Weather, and Ships bearing up for Anchorage. In 1807 he was elected Professor in Perspective to the Royal Academy, in which situation he continued to deliver lectures to the students for many years. In 1808 he commenced an artistic work, entitled the 'Liber Studiorum,' which is now very rare, and commands a high price. He died at Chelsea in 1851. By his will he bequeathed to the nation all the drawings and pictures then in his possession, and left his funded property towards the founding of an asylum at Twickenham for reduced artists.

TURNPIKES (xii. 375). In the 'Mutiny Act,' there is an express provision that 'all Her Majesty's officers and soldiers, being in proper staff or regimental or military uniform, dress, or undress, and their horses; and all carriages and horses belonging to Her Majesty, or employed in her service, when conveying persons or baggage, under the provisions of this Act, or returning therefrom, shall be exempted from payment of any duties and tolls on embarking or disembarking from or upon any pier, wharf, quay, or landing-place, or passing turnpike-roads or bridges.'

TURNSTILE, an ingenious apparatus, used at the entrances of public exhibitions and at the ends of toll-paying bridges, which acts, by a revolving motion, as a register of the number of passengers, and the amount received by the money-takers. This machine can only rotate in one direction, and only one person can pass at a time. Until the money-taker presses his foot on a lever the turnstile cannot rotate at all; but directly the passage is effected, the lever is allowed to drop, and the turnstile is again locked. The movement is effected by means of a toothed wheel to the extent of one tooth; and the attendant has to account for the money received according to the number of wheel teeth which have been moved during the day.

TWISS, HORACE, a prolific writer, and a distinguished member of the House of Commons. He wrote the life of Lord Eldon, and held several political or legal appointments; among others, that of Vice-Chancellor in 1844. He died in 1849.

TYRONE, County of, Ireland (xii. 397–401). According to the census of 1851, the entire population was 254,878. The area of the county was estimated at 1260 square miles, or 806,640 acres, of which 420,286 are arable, 311,867 uncultivated, and 11,981 plantations. The population of the principal places was as follows:—

Augher . . .	614	Fintona . . .	1504
Augnachloy .	1703	Newtown Stewart. . . .	1402
Ballygawley .	768	Omagh . . .	3054
Caledon . . .	999	Stewartstown .	1022
Clogher . . .	1700	Strabane . .	4326
Cookstown . .	2993		
Dungannon . .	3835		

TYTLER, PATRICK FRASER, author of 'The History of Scotland,' 'Lives of Scottish Worthies,' &c., was the fourth son of Lord Woodhouselee, and born at Edinburgh in 1791. His life was devoted to the pursuit of literature, chiefly of an historical and biographical character. Among his numerous works may be mentioned (in addition to the above), his Lives of the 'Admirable Crichton,' of Sir Thomas Craig, of John Wycliffe, of Sir Walter Raleigh (1833), of Henry the Eighth (1837), and the 'History of England under the Reigns of Edward VI. and Queen Mary.' In acknowledgment of claims so well founded, Sir Robert Peel granted him a pension of 200*l.* per annum. He died at Edinburgh in 1849.

U.

UBIQUITA'RIANS, or U'BIQUISTS (Lat. *ubique* everywhere), a sect of early Lutherans, whose distinguishing doctrine was, that Jesus Christ was everywhere at the same time. The sect arose in 1560, and Melancthon strongly opposed it, as well as the Universities of Wirtemberg and Leipsic. But it was all in vain. In 1777 the leaders of the sect published a formula of faith, wherein the Ubiquity of Christ was established—a doctrine which still prevails in Germany and elsewhere.

ULSTER (xii. 412). According to the census of 1851, the population of the province was 2,286,822. The entire area was estimated at 8555 square miles, or 5,475,438 acres, of which 3,407,539 are arable, 1,764,370 uncultivated, and 214,856 under water. This province is the head-quarters of the Irish linen manufactures, and of other branches of manufacturing industry, of which Belfast is the principal seat. The annual value of the linens made is estimated at 5,000,000*l.*; and their manufacture employs about 170,000 hands. The province is divided into nine counties, Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone; the population of which is given under their respective heads (*Supplt.*). Protestantism is the prevailing religion.

UMBILI'CAL CORD (Lat. *umbilicus* the navel), in anatomy, the navel string, or cordlike intestinal substance, that proceeds from the navel of the fœtus to the centre of the placenta. It is about 18 inches long, and is a cellular substance, composed of a cutaneous sheath, two umbilical arteries, and one umbilical vein. The arteries convey the blood from the fœtus to the placenta; and the vein carries it from the placenta to the fœtus. That portion of the abdominal parietes, about two inches round the navel, is called the *Umbilical Region*.

UMBRELLAS, and PARASOLS. The use of these portable conveniences has now become so general, as a protection against rain on the one hand, and the sun's rays on the other, that a few brief notices of this now important branch of our manufacturing industry may be acceptable.

The principal cause of the very moderate cost of our low-priced umbrellas and parasols in England arises from that well-planned division of labour which now so generally prevails in all our large manufacturing establishments. The author of 'Novelties, Inventions,' &c., has thus described the usual processes of umbrella manufacturing:—'In preparing an ordinary umbrella stick, usually of stained beech, it passes through nineteen different processes or movements. In preparing the ribs, of cane or whalebone, each passes thirteen times through the hand, making 104 times for the eight. In weighing the ribs, to give them all an equal flexure and similar curve, there are eight more transfers from hand to hand. In threading the ribs to the stretchers, the sum total of operations for the entire frame is brought up nearly to 150. All this labour is done for a price so inconceivably small as to be scarcely credible. It varies from one halfpenny to two-pence halfpenny for the cheapest kinds of parasols and umbrellas. One man and four lads can put together nearly 100 such frames in a day. The women and girls, who cover the umbrellas and parasols with silk, alpaca, or gingham, receive a penny apiece for the commonest, and thence rise to higher prices for the best.'

The process of putting together the frames with cane and whalebone ribs is chiefly done by small masters in London, who are assisted by boys. The covering is performed by women and girls at their own homes. The frame-maker is supplied with the sticks, ribs, stretchers, and runners, from the warehouse; but he provides the iron wire and the plate-brass, as well as all the working apparatus. The fixing of the handles and ferules is generally done at the warehouse where the umbrellas are sold. But, notwithstanding the small cost of all these operations, the London manufacturers are out-cheapened by those of Birmingham, where an umbrella frame, comprising stick, ribs, stretchers, and ferule, can be made and sold for seven-pence!

U'NICORN (Lat. *unus* one, and *cornu* a horn), an animal represented with one horn, and mentioned in Scripture as well as in the writings of Greek and Latin authors. It is supposed to be still extant in Ethiopia, and has been described by M. Rupell as an animal equal in size to a small horse, but slender as the gazelle, and furnished with a long slender horn, as represented in the supporters of our royal arms. The most learned of our modern naturalists, however, consider it as a fabulous animal, although it is said that its true place was the province of Azoas, in Ethiopia. The first author who wrote upon it, it appears, was Cresius, whom Aristotle mentions as a very suspicious author.

UNIONA'CEA (Lat. *unio* a pearl), a tribe of bivalved Mollusca, belonging to the order *Asiphonata*, of which the *Unio*, or River Mussel, is the type. They are all inhabitants of fresh water; and several species of the tribe are found in this country; one of the commonest of which is the *Unio pictorum*, so called from the shell having been much used by painters for holding their colours. The whole tribe may be described as having equivalve shells, lined with pearly matter, and covered with a smooth epidermis; the adductor muscles being two in number, and the foot very large. All the different species furnish pearls of an inferior quality; the American species being very numerous; but the *Unio margaritiferus* (Pearl Mussel), which is an inhabitant of the mountain streams of this country, is so called on account of the pearls it contains.

UNIONS. [PAUPERS, and PAUPERISM, *Suppl.*]

UNITED BRETHREN [MORAVIANS, viii. 704]. Some interesting details of the history of this ancient but still numerous body of Reformers are given by Crantz, in his 'History of the Unitas Fratrum;' by Milner, in his 'Church History;' and by the Rev. R. Adam, in his 'Religious World Displayed;' from whose works the following brief notices are gleaned.

The church of the United Brethren, or 'Unitas Fratrum,' originally consisted of three branches,—the Bohemian, Moravian, and Polish. After its renovation, in the year 1722, some of its members came to England in 1728, who, being of the Moravian branch, became known by that appellation; and all those who joined them, and adopted their doctrines and discipline, have ever since been called Moravians; though, strictly speaking, that name is not applicable to them, nor generally admitted, either by themselves, or in any public documents, in which they are called by their proper names, The Unitas Fratrum, or United Brethren. The few remaining members of the ancient Church of United Brethren in Bohemia, Moravia, and Poland, being much persecuted by the Popish clergy, many of them, leaving all their possessions, fled with their families into Silesia and Saxony. In Saxony they found protection from a Saxon nobleman, Nicholas Lewis Count Zinzendorff, who gave them some waste land on one of his estates, between Budissin and Zittau, in Upper Lusatia, upon which, in 1722, they built a village, at the foot of a hill called the Hut-Berg, or Watch-hill. This gave them occasion to call their settlement Herrnhut, the Watch of the Lord. Thence arose the name Herrnhutters, given them in derision. Count Zinzendorff was a pious man, and a Lutheran by education. He hoped that the religious state of the Lutherans in his neighbourhood would be much improved by the con-

versation and example of these devout emigrants, and sought to prevail upon the latter to join the Lutheran Church altogether. To this the Brethren objected, being unwilling to give up their ancient discipline, and would rather proceed to seek an asylum elsewhere; when the Count, struck with their steadfast adherence to the tenets of their forefathers, began more maturely to examine their pretensions, was convinced of the justness of them, procured for them the renovation of their ancient constitution, and ever after proved a most zealous promoter of their cause. Having been examined and received into the clerical order by the theological faculty at Tubingen, in the duchy of Wirtemberg, in 1735, the Count was consecrated bishop of the Brethren's Church at Lissa in 1737. Archbishop Potter congratulated him on this event, and promised his assistance to a church of confessors, of whom he wrote in terms of the highest respect, for their having maintained the pure and primitive faith and discipline in the midst of the most tedious and cruel persecutions. His Grace, who was well versed in the principles of church government, admitted the Moravian Episcopal succession; and, in conformity with his sentiments, the Parliament of Great Britain, after mature investigation, acknowledged the *Unitas Fratrum* to be an ancient Protestant Episcopal Church, and passed an Act in their favour in 1749, which relieved them from taking oaths, and from other political disabilities.

UNITED STATES OF NORTH AMERICA (xii. 426–34). According to the census of 1850, the entire population of the thirty-one States amounted to 23,191,876; of which there were 19,553,068 whites; 434,495 free coloured persons; and 3,204,313 slaves. The area was estimated at 3,384,865 square miles; with 70 inhabitants to each square mile. But, according to an estimate made in the United States 'Topographical Bureau,' in January 1854, the total area, including the territorial cessions of Mexico, was only 2,963,666 square miles. The extreme length of the United States is estimated at 2700 miles, and its greatest breadth 1600 miles.

The number of representatives in Congress in 1850 was 234; but since that period an additional member has been added to the following States:—Alabama, Connecticut, Delaware, Florida, Georgia, Indiana, Kentucky, Massachusetts, Maryland, Missouri, New York, Pennsylvania, Rhode Island, Tennessee, and Texas.

Besides the thirty-one States which send representatives to Congress, in number according to their population, there are several local dependent governments, which are styled 'Territories of the United States.' Such are the territories of Oregon, Washington, Utah, New Mexico, Minnesota, Nebraska, and Kansas. *Oregon* was erected into a territory on the 14th August, 1848; *Minnesota*, on the 3rd March, 1849; and *Utah* and *New Mexico*, on the 9th Sept. 1850. *Washington*, originally a part of Oregon, was formed into a separate territory at the Session of Congress, 1852–53. *Nebraska* and *Kansas* were both erected in 1854, from the north-western portion of the old Louisiana cession, between the Rocky Mountains and the States of Missouri and Iowa, and the territory of Minnesota.

In 1850 the aggregate number of 'free white male persons' in the United States, over fifteen years of age, employed in professional and industrial pursuits, was 5,371,876; and of these, the number employed in commerce, trade, manufactures, mechanic arts, and mining, was 1,596,265; in agriculture, 2,400,583; in labour not agricultural, 993,620; in the army, 5370; in sea and river navigation, 116,341; in law, medicine, and divinity, 94,515; in other pursuits requiring education, 95,814; in government and civil service, 24,966; in domestic service, 22,243; and in other occupations, 22,159.

The following were the principal employments in 1850:—agricultural implement makers, 1313; bakers, 14,256; bell and brass founders, 1353; black and white smiths, 99,703; boat-builders, 2086; bookbinders, 3414; boot and shoemakers, 130,473; brewers and distillers, 4854; brickmakers, 11,514; cabinet and chair makers, 37,359; carpenters, 184,671; clothmakers, 253; coachmakers, 14,049; cutlers, 892; dyers and bleachers, 3241; engineers, 11,626; engravers, 2208; factory hands, 10,869; file-cutters, 291; glass manufacturers, 3237; gold and silversmiths, 3082; hardware manufacturers, 819; hat and cap manufacturers, 11,024; ironfounders, 9271; iron-workers, 5008; jewellers, 5111; labourers, 909,786; lime-burners, 1013; machinists, 24,095; masons and plasterers, 63,392; millwrights, 9613; miners, 77,410; morocco dressers, 1923; nail-manufacturers, 2046; oil-cloth makers, 388; paper-makers, 2971; plane-makers, 377; plumbers, 1304; potters, 4155; powder-makers, 220; printers, 14,740; quarrymen, 1932; saddle and harness makers, 22,779; lath and blind makers, 2026; ship carpenters, 14,585; stone and marble cutters, 14,076; tailors, 52,069; tanners and curriers, 14,988; tobacco and cigar makers, 10,823; type-founders, 211; watch-makers, 2901; weavers, 31,872; wheelwrights, 30,693; woollen manufacturers, 1037;—total occupied in trades and professions, 5,371,876.

It appears that the population of the United States increases naturally and by immigration more than three per cent. annually; as will be seen from the following tabular view of the population of the different States in 1855:—

States.	*Pop.*	*States.*	*Pop.*
Alabama ..	835,192	Michigan ...	509,374
Arkansas ...	253,117	Mississippi	723,878
California ..	327,108	Missouri ..	812,505
Connecticut	383,918	New Hampshire ...	337,918
Delaware ...	94,712	New Jersey	569,499
Florida ...	110,725	New York	3,470,059
Georgia ..	935,090	North Carolina ..	923,876
Illinois ...	1,242,917	Ohio ..	2,311,017
Indiana ...	1,198,777	Pennsylvania	2,542,960
Iowa ...	325,014	Rhode Island	166,541
Kentucky ..	1,113,594	South Carolina ..	704,814
Louisiana ..	589,722	Tennessee...	1,107,446
Maine ...	652,710	Texas ..	422,812
Maryland ...	661,817		
Massachusetts ...	1,133,123		

States.	*Pop.*
Vermont ...	326,777
Virginia ...	1,527,913
Wisconsin...	552,109
Territories.	
Kansas ...	8,521
Minnesota..	75,000
Nebraska ...	4,565

Territories.	*Pop.*
New Mexico	63,112
Oregon ...	21,571
Utah ...	37,288
Washington	5,509
District of Columbia	58,127
Total	27,130,727

During the first hundred years after the settlement of Boston (1630), it was the largest city of the colonies. New York became as populous as Boston just before the revolutionary war; about 1811, New York became as populous as Philadelphia, each containing 100,000 inhabitants. Baltimore overtook Boston about the year 1800. The principal new cities grew to the number of 10,000 nearly as follows:—Pittsburg in 65 years; Louisville, 50 years; Cincinnati, 22 years; Cleveland, 40 years; Detroit, 45 years; New Albany, 35 years; Chicago, 12 years; and Milwaukie, 10 years. The above-named cities attained to 20,000, in the number of years from their birth as follows: Boston, 163; Albany, 220; New York, 150; Philadelphia, 80; New Orleans, 113; Baltimore, about 80; Pittsburg, 75; Louisville, 41; Cincinnati, 30; Cleveland, 45; Detroit, 52; Chicago, 16; and Milwaukie, 17 years.

There are in the United States 75 theological seminaries (belonging to the several denominations of Christians), 20 law schools in different parts of the Union; 44 medical schools, some of them connected with colleges, and 10 of practical science. The number of primary and public schools, on the first of June 1850, was 80,991, with 92,000 teachers, and 3,354,173 scholars—annual income, 9,591,530 dollars; of academies and other schools, 6032, with 12,207 teachers, and 261,362 pupils—annual income, 4,653,842 dollars; and of universities and colleges, 234, with 1651 teachers, and 27,159 students—annual income, 1,916,628 dollars. The amount of public funds disbursed on account of education in the year ending at the above date was 2,874,016 dollars. There are 715 meeting-houses belonging to the Friends, or Quakers, with an aggregate membership of 283,023. In Maryland they have 26 meeting-houses and 7760 members; in the district of Columbia, one meeting-house and 200 members; in Virginia, 14 meeting-houses and 6300 members; and in Pennsylvania, their favourite State, 141 meeting-houses and 60,974 members.

The aggregate number of newspapers and periodicals published in the United States in 1850, according to the census, was 2526, circulating 5,183,017 copies, or 426,409,978 copies annually. Of this number 254 were issued daily, 115 tri-weekly, 31 semi-weekly, 1902 weekly, 95 semi-monthly, 100 monthly, and 19 quarterly; and, classified in relation to their characteristics, 568 were literary and miscellaneous, 83 neutral and independent, 1630 political, 191 religious, and 53 scientific. Boston issues 113 papers, with an annual circulation of 54,000,000; New York, 104 papers, circulation 78,000,000, and Philadelphia, 51 papers, circulation 40,000,000.

The regular army of the United States is rather limited. It consists of only about 1000 officers, who have received a strictly-proved education, and who are prepared to be normal military instructors for an armed militia, and of about 10,000 regular troops. But the enrolled militia comprises 9470 officers and 2,150,000 men. The fleet consists of 11 ships of the line from 80 to 120 guns, 14 frigates of 50 to 60 guns, 20 corvettes, 6 steam frigates afloat, and several building, 10 steam corvettes, and some smaller vessels.

The value of the harvests, in the year 1850, exceeded 1,000,000,000 dollars. At that time there were 113,000,000 acres under cultivation, and 180,000,000 more included within the limits of farms, making in all, 293,000,000 acres. The value of the cotton crop amounted to 98,608,720 dollars; while that of the hay crop was 96,870,494 dollars. Of this crop a very considerable portion is produced in the south. The single State of Maine produces more hay than all the southern States.

According to the official returns of 1855, the crop of Indian corn amounted to 600,000,000 bushels, valued at 360,000,000 dollars. The crop of wheat to 165,000,000 bushels, valued at 247,500,000 dollars. Oats, 170,000,000 bushels, value 68,000,000 dollars. Potatoes, 110,000,000 bushels, value 41,250,000 dollars. Rice, 200,000,000 lbs., value 101,000,000 dollars. Cane sample sugar, 589,000,000 lbs., value 37,350,000 dollars. Cotton, 1,700,000,000 lbs., value 136,000,000 dollars. Hay and fodder, 16,000,000 tons, the value 160,000,000 dollars.

There are in the United States 1217 distilleries, in which 5240 persons are employed, and a capital of 8,507,674 dollars is invested. They consume yearly 11,367,761 bushels of corn, 3,787,175 bushels of barley, 2,143,927 bushels of rye, 56,240 hogsheads of molasses. They manufacture 42,461,920 gallons of ale, 41,864 of whisky and high wines, and 6,500,000 of rum.

The total value of exports of the growth, produce, and manufacture, of the United States, for the year ending June 30, 1853, according to the report of the Registrar of the Treasury, was 213,417,697 dollars; the value of the three leading products of the Southern States, cotton, tobacco, and rice, amounted to 122,433,381 dollars, leaving a balance of 90,984,316 dollars for all other products and manufactures.

In 1854 there were in use within the country 41,392 miles of telegraphic wires, of which 36,972 miles were using instruments on Morse's plan; 3850 miles those on House's plan, and 570 miles that of Bain. The capital invested in these lines makes a total of 6,671,800 dollars, of which 5,545,800 dollars represented the Morse lines, 955,000 dollars the House lines, and 171,000 dollars the Bain lines. 'Only ten years ago,' says Shaffner, 'Professor Morse was building the experimental line between Washington and Baltimore; that forty miles was the longest telegraphic line in the world. Since then the web has been spread from city to city, and people

throughout the entire land enjoy the blessings of this element of nature, subdued to the utility of man.'

Since the completion of the New York and Erie Railway, passengers can go from New York to Dunkirk, on the Lake, in a single day—a distance of about 400 miles.

UNIVALVES (Lat. *una* one, and *valva* a valve), a name applied to those mollusca which consist of one shell only; while those with two shells are called *Bivalves*. The univalve shell is generally a spiral tube, which increases in size towards the orifice, whence the animal obtrudes itself when in motion. The difference between the shelly structures of the Univalve and Bivalve correspond with the differences in the conformation of the animals. In the Univalves, for instance, the head of the creature is well defined, and it is usually furnished with tentacula, eyes, and other special organs of sense; while the Bivalves exhibit no traces of any distinct head. The different species of the Trochus, the Snail, &c., may be given as specimens of the Univalve Mollusca.

UNIVERSALISTS, a sect of religionists who believe that all mankind, through the mediatorial power of Christ, and the *universal* operation of grace, shall be brought to a participation of the benefits of their Saviour's death, by their final restoration to holiness and happiness. Though they admit the reality and justice of future punishment, they contend that it will be corrective in its nature, and limited in its duration. In maintaining that the great scheme of the Gospel is universal reconciliation, they quote, among other texts, Ephes. i. 9-11: 'Having made known unto us the mystery of his will, according to his good pleasure which he hath purposed in himself: that in the dispensation of the fulness of times he might gather together in one all things in Christ, both which are in heaven, and which are on earth; even in him: in whom also we have obtained an inheritance, being predestinated according to the purpose of him who worketh all things after the counsel of his own will.' Agreeably to this text, the Universalists teach the doctrine of election, but not in the exclusive Calvinistic sense. They also teach that 'the wicked will receive punishment apportioned to their crimes;' but that 'punishment itself is a mediatorial work, and founded upon mercy; consequently, that it is the means of humbling, subduing, and finally reconciling the sinner to God.'

UNIVERSITIES (xii. 435). [For Reforms in our two English Universities, see CAMBRIDGE and OXFORD.]

UPCOTT, WILLIAM, for many years sub-librarian of the London Institution, and one of the first autograph collectors in the kingdom, was a native of Oxfordshire, and born in 1779. He was brought up as a bookseller, and appointed sub-librarian of the London Institution in 1806; when, at the same time, the learned Professor Porson was elected the principal librarian. In that situation Mr. Upcott remained until 1834, having fulfilled its onerous duties with great credit for a period of twenty-eight years. In 1818 he published a very useful work of reference, in three volumes 8vo., entitled 'A Bibliographical Account of the principal Works relating to English Topography,' and in 1825 he brought out an edition of the 'Miscellaneous Works of John Evelyn, the Author of 'Sylva.' In 1828 the 'Correspondence of Henry Earl of Clarendon,' and in 1830 that of Ralph Thoresby, were published from his collections. In 1836 Mr. Upcott issued a brief description of the autograph collections which he had been accumulating for a long series of years. It was printed in a large quarto volume, and entitled, 'Original Letters, Manuscripts, and State Papers.' In this collection were embodied the papers and correspondence of Henry second Earl of Clarendon, Emanuel de Costa the Naturalist, Ralph Thoresby of Leeds, J. and S. Dayrolles, and others, the whole of which comprised 32,000 letters, exclusive of manuscripts, illustrated with 3000 portraits. Mr. Upcott was also the means of preserving and bringing to light the interesting 'Diary of John Evelyn.' The first edition was edited by Mr. Bray, and the second superintended by himself. He died at Islington in 1845.

URANIIDÆ (Gr. *οὐράνιος* heavenly), a tribe of Lepidopterous insects, usually placed in the sub-order *Rhopalocera*, which includes a numerous and beautiful species of butterflies, all diurnal in their habits, and flitting about from flower to flower in the warmest sunshine; and it is in the hot climates that the most magnificent and largest species abound.

URANOGRAPHY (Gr. *οὐρανὸς* heaven, and *γραφὴ* a description). [ASTRONOMY, ii. 322-36; PLANETS, ix. 615, and *Suppl.*]

URE, ANDREW, M.D., F.R.S., &c., a celebrated chemist, and author of the 'Dictionary of Arts and Manufactures,' was born at Glasgow in 1778. He studied medicine at Edinburgh, and in 1801 received his degree of M.D. in Glasgow. In 1809 he was appointed astronomer of the observatory then established in his native city. He distinguished himself at this period by the publication of different scientific works, which brought him into considerable repute. In 1821 appeared his 'Dictionary of Chemistry,' which displayed an extensive knowledge of the subject with which his name is so pre-eminently associated. In 1829 he published his 'System of Geology,' which strongly advocates the influence of Noah's deluge on the surface of the earth. In 1830 he proceeded to London, when the Board of Customs appointed him their analytical chemist. In 1835 he brought out a work on the 'Philosophy of Manufactures;' but his greatest undertaking was his 'Dictionary of Arts and Manufactures,' which appeared in 1839, and has been much appreciated for the vast variety of information it contains. A second edition was published in 1853. He was a fellow of most of the scientific societies both in this country and on the Continent; and was universally esteemed for his attainments in many branches of science. He died in London in 1857.

URIM and THUMMIM (Heb. *light* and *perfection*), the name of a mysterious kind of ornament worn in the habit of the Jewish high-priest,

which was consulted as an oracle on occasions of importance. Various are the conjectures upon this subject; and the Scriptures do not appear anywhere to elucidate the mystery. We learn that when the Urim and Thummim was to be consulted, the high-priest put on his robes, and going into the holy place stood before the curtain that separated the sanctum from the sanctuary; then turning his face directly towards the ark and the mercy seat over it, upon which the divine presence rested, he proposed what he wanted to be resolved about; and directly behind him, at some distance, without the holy place, stood the person at whose command or entreaty God was consulted; and there, with all humility and devotion, expected the answer. The ceremony was probably of Egyptian origin; for we are informed, by Diodorus Siculus, that there was a similar form in use among the Egyptians, whose principal minister of religion and justice wore a collar of precious stones about his neck, which was called Ἀλήθεια, or Truth. According to the testimony of Josephus, the oracular ceremony of the Urim and Thummim ceased about 112 B.C. (Josephus; Diodorus; Calmet).

URNS, among the Greeks and Romans, were round-shaped vases, chiefly used for preserving the ashes and remains of deceased relatives or friends, after they had been burnt upon the funeral pile. They were chiefly made of a bluish-grey, red, or blue colour; though sometimes, for persons of high condition, they were gold, silver, or brass. The Hamilton collection of cinerary urns, in the British Museum, presents some admirable specimens, illustrative of their form and composition.

USKO, REV. JOHN FREDERICK, Rector of Orsett, Essex, and celebrated as a linguist, was a native of Lyck in Prussia, and born in 1761. He was educated at the provincial college of that town, and afterwards removed to the university of Konigsberg. Having obtained a considerable knowledge of the Eastern languages, in 1820 he was sent, by the town of Dantzic, to Smyrna, as Pastor to the Evangelical German community resident at that port. Having become familiar with the English language while at Smyrna, he was induced to offer himself as a candidate for the vacant situation of Chaplain at the English factory, and was elected to that office in 1788. In 1789 and 1790 he travelled in Egypt and Syria; and in 1792 in Turkey and Greece. In 1795–6 he travelled with Mr. Randle Wilbraham to Babylon, Persia, and Arabia. Of these travels he published, in 1808, a very interesting narrative. In 1798 he paid a visit to England, and was introduced to Bishop Porteus. He again visited the Continent, and from thence returned to Smyrna in Oct. 1799, where he married the daughter of Dr. Zimmerman. He remained at Smyrna until Feb. 1807, when he, with other English residents, received a peremptory order to quit the place. He again came to England, and was hospitably received by the Bishop of London, who presented him with the valuable living of Orsett, in Essex.

Mr. Usko was the author of a grammar of the Arabic language, with an analysis of the words, and a vocabulary explanatory of the three first chapters of Genesis. But his most remarkable talents were in the ready acquisition of languages. In the 'Autobiography of his Literary Life,' he says, 'Those languages I have learnt *grammatically* are the German, Polish, Latin, Greek (ancient and modern), Arabic, Hebrew, Syriac, Chaldaic, Turkish, Persian, English, Italian, French, Spanish, and Dutch. I have preached in Prussia in German and Polish; in Smyrna, in Italian, French, English, and German.' He died at Orsett, in Dec. 1842, aged 81.

UTAH, NORTH AMERICA (xii. 467). [MORMONS, *Supplt.*]

UWAROWITE, a transparent mineral, which occurs in small rhomboidal dodecahedrons of an emerald-green colour. It is said to be a species of garnet, but is distinguished from that mineral by its infusibility before the blow-pipe. Its hardness is 6·0. It was so named in honour of M. Uwarow, president of the Academy of St. Petersburg.

UWINS, THOMAS, R.A., an artist of some eminence, was born in Pentonville, London, in 1783. In early life he entered himself as a student at the Royal Academy, and afterwards practised almost exclusively in water colours. In 1811 he was elected a member of the Society of Painters in Water Colours. In 1826 he visited Italy; and painted many interesting scenes illustrative of the Italian peasantry, which acquired considerable popularity. Among other subjects may be mentioned his 'Neapolitan Peasantry returning from a Festa;' 'Mountaineers returning from the Festa;' 'Bay of Naples;' 'Children asleep in a Vineyard;' &c. He afterwards entered upon a loftier class of subjects, and painted 'Cupid and Psyche' (for Prince Albert); 'John the Baptist proclaiming the Messiah,' &c. In 1836 he was elected a Royal Academician; and from 1844 to 1855 he was librarian to the Academy. In 1847 he was appointed keeper of the National Gallery. He died at Staines, in Middlesex, in 1857. In Vernon's collection of pictures, and also in Sheepshanks's, may be seen several characteristic and pleasing examples of his prolific pencil.

V.

VALLEY, LILY OF THE. [CONVALLARIA, *Supplt.*]

VALPY, ABRAHAM JOHN, M.A., M.R.S.L., an eminent classical printer and publisher, was the son of the Rev. Dr. Valpy, master of the Reading Grammar School, and born in 1788. Having been early imbued with classical learning under his father, he proceeded to Pembroke College, Oxford, and graduated as B.A. in 1809, and M.A. in 1811. While yet a youth, he published a collection of 'Excerpta from Cicero's Epistles' (1804), with a Latin address to his schoolfellows. The object of his father was to establish him as a printer, so that he might become a worthy successor of the Aldus's and Stephens's of former periods, and rival the celebrated classical printer, William Bowyer. He was accordingly apprenticed to a freeman of London (Mr. Priddeh), and became a liveryman of the Stationers' Company in 1807. He first commenced the business of a printer in Took's Court, Chancery Lane; and afterwards removed to Red Lion Passage, Fleet Street—the very spot where the learned Bowyer terminated his career as a printer, in 1777, and was succeeded by Mr. John Nichols, editor and proprietor of the 'Gentleman's Magazine.' Mr. Valpy did not devote much of his time to the literary departments of his business, but employed those men who were distinguished in the republic of letters by their classical attainments; among whom may be mentioned Mr. E. H. Barker, of Thetford, who edited the 'Greek Thesaurus,' printed and published by Valpy; and Mr. G. Dyer, who edited Valpy's voluminous edition of the Classics, with variorum notes, published in 143 volumes. Mr. Valpy also published a variety of works which passed through the press under his immediate supervision; among others, the Classical Journal, the Pamphleteer, the Greek Septuagint, Homer's Iliad, the Museum, an Epitome of English Literature; besides a vast number of minor editions of the Greek, Latin, and English classics. He retired from business, on an ample competence, in 1838, and died in 1855.

VANA'DIUM (from *Vanadis* a Scandinavian deity), in chemistry, one of the acidifiable bases; a very rare metal, first discovered in 1830 by Professor Seftatröm. It is white and brittle, and not oxidizable by air or water; soluble in nitric acid, but insoluble in muriatic, sulphuric, and hydrofluoric acids. The solutions produced by nitric or nitro-muriatic acids are of a fine dark blue colour.

VANCOUVER ISLAND, a British settlement, situated on the western coast of North America, in the North Pacific. It extends from lat. 48° 20′ to 51° N., and from long. 123° to 128° W. It was first discovered by Vancouver, and from him received its name. Its length is about 300 miles, and the greatest breadth 75; the estimated area being 16,000 square miles. Its population is extremely limited. The island is separated from the mainland, which constitutes the Oregon territory, by the Gulf of Georgia and Queen Charlotte Sound. On the west coast are Nootka Sound, and some other commodious harbours. On the southern part of the island is the settlement of Victoria, which is formed on a harbour named Camosack.

In 1846 the island was conceded to the Hudson's Bay Company by charter, on condition that they should colonize it; the British government retaining the right of renewing possession within a given period. It does not, however, appear that the Company have undertaken anything worthy of attention. But the recent discoveries of gold in the island, and more especially in the great Fraser River, have caused a simultaneous rush of adventurous spirits towards that part of the world, and given an importance to the place, which it never previously possessed.

The following particulars, communicated by a gentleman who resided many years in that part of the world, will be found interesting. He arrived at Vancouver Island in 1849, and then the only settlement of even minor importance was *Victoria*, which is now called the capital. It then consisted of an enclosure of palisades, thirty feet high, with an area of a few acres. The two opposite corners were surmounted with bastions, on which were painted an infinite number of port-holes (with a view of frightening the natives), but which in reality mounted but six guns apiece. Inside this were some thirty or forty houses, in which resided those in the employ of the hon. Hudson's Bay Company (for as yet there were no colonists), numbering in all about 200. In consequence of the Americans taking possession of Fort Vancouver on the Columbia River, which before had been the centre of the Company's trade, Victoria became their chief station, to which all furs and other commodities were brought down previous to their being shipped for England. Soon, therefore, houses sprung up in all directions, forming a large though straggling town. A few colonists slowly found their way out there, and other settlements were formed, the principal of which were Esquimault, with a harbour commodious enough to contain the Pacific fleet; Toke, from which quantities of timber, principally pine (that equals any in the world), is exported to San Francisco and China; Ninaymo, famous for its coal, which is also exported chiefly to San Francisco; also Fort Langley, which was merely a small station of the Company's, but in

the neighbourhood of which the gold was first found in 1856. In 1850 the first governor reached the island, who only remained there for a year and a half, then returning to England on account of ill-health. In November 1851, after he left, a chief factor in the Company's service, Douglas, was appointed, who has given great dissatisfaction to the colonists.

The vegetable, mineral, and animal productions of the island are numerous. Of timber, the principal is the fir, oak, beech, birch, maple, and larch. Of minerals, iron, copper, lead, sandstone, limestone, and lastly, *gold*, have been discovered. The animals, whose furs are exported to England by the Hudson's Bay Company, are the otter, brown bear, puma, beaver, ermine ; the others are the wolf, racoon, minx, wild-cat, and rat, native dog, elk, deer, and brown squirrel. All the domesticated animals of England thrive there. In the way of birds, there are wild ducks, geese, grouse, eagles, ravens, vultures, thrushes, woodpeckers, humming-birds, blue jays, and various others.

VANDALS, a name frequently mentioned in early history, as applying to those ruthless invaders of Western Europe, who were mainly instrumental in overthrowing the Roman Empire. They were of Teutonic and Sclavonic origin, and resided chiefly in Pomerania and Eastern Prussia; but on the decline of the Roman Empire, being a warlike race, they left their native wilds, and overran the greater part of Europe. From their fierce and destructive character, the term, as applied to them, has come into modern use proverbially to signify a barbarian, or ferocious person.

VANES'SA IO, or PEACOCK BUTTERFLY. [PAPILIONIDES, *Supplt.*]

VARA, a Spanish measure of length, which, in Castile, is equal to 0·925 of an English yard; and this standard still prevails in those States which belong, or formerly belonged, to Spain. Thus the vara at Havannah is 0·927 of an English yard ; in Chili 108 varas make 100 imperial yards; and the Mexican vara is three geometrical feet. The solid vara of Spain is 20·561 cubic feet. (Simmond's *Dict. of Trade Products.*)

VARNA, a city and seaport town of European Turkey, situated on the west coast of the Black Sea, in the province of Bulgaria; population about 20,000. It is strongly fortified ; but, notwithstanding, it was captured by the Russians in 1828. It is a miserably-built town ; but has acquired some notice from the circumstance of the Anglo-French army, in the Crimean expedition of 1854, having encamped in the suburbs, previous to its embarkation from that port.

VAUQUEL'INITE, a mineral which occurs in spotted black crystals, and so called in honour of M. Vauquelin, the French chemist; specific gravity, 5·8; hardness = 2·5 to 3·0. Its component parts are oxide of lead, 60·87; chromic acid, 28·33; oxide of copper, 10·80.

VEDRO, the principal Russian measure for liquids, which has been definitively determined at 750 cubical inches for its contents, or 2·7051 imperial gallons.

VEGETABLE EARTH, in Horticulture the soil which is usually called Mould ; in Agriculture, the surface soil of hollows which contain alluvial soil, a black vegetable matter, beneath. *Vegetable Ivory* is the term applied to the seed of the South-American trees, *Phytelephas macrocarpa* and *microcarpa*, which are used in making trinkets, buttons, heads to walking sticks, &c. *Vegetable Marrow* is the name given to the gourd, *Cucurbita ovifera*, of which there are several varieties.

VEL'ITES (Lat. *velitor* to skirmish), the light-armed infantry of the Roman armies, so called from their agility and swiftness, and first instituted during the second Punic war. They were armed with javelins, bows, and slings; and their cuirass, casque, and shield were of a very light construction. These Velites were stationed in loose order before the army, to be employed when occasion required. They were disposed sometimes before the front of the Hastati, sometimes dispersed up and down among the void spaces of the Hastati, and sometimes placed in two bodies in the wings. The Velites generally began the combat, skirmishing in flying-parties with the first troops of the enemy, and, when repulsed, fell back by the flanks of the army, or rallied again in the rear. These tactics corresponded, in some measure, with the skirmishers, or rifle-corps, of modern armies.

VENI'RE FACIAS (xii. 569). This kind of writ, which is of great antiquity, has been virtually abolished by the Common Law Procedure Act of 1852, as well as the *Habeas Corpora Juratorum*, the *Distringas*, &c. A much simpler jury process is now adopted.

VENUS DE MED'ICI is the name of one of the most celebrated relics of ancient sculpture ever transmitted to our times; and considered a perfect specimen of artistic skill and beauty. It appears to have been the production of Cleomanes, the son of Apollodorus of Athens, who lived about 200 years before Christ. It was found in the Villa of Hadrian, near Tivoli, about the year 1680; but it was broken into several pieces, which had to be united together. It is now placed in the Imperial Gallery at Florence.

[In Botany, the name of *Venus* is of frequent adaptation to different plants; as, *Venus's Comb*, the English name of the plant Scandens pecten Veneris; *Venus's Fly-Trap*, the plant Dionæa muscipula; *Venus's Looking-glass*, the name of the plants belonging to the genus Specularia; *Venus's Navelwort*, a term applied to several species belonging to the genus Omphalodes; *Venus-Sumach*, the shrub Rhus Cotinus; a rich yellow dye, much used by the modern Athenians for dyeing wool.]

VERMIC'ULITE (Lat. *vermiculus* a little worm), a mineral consisting of micaceous-looking plates; specific gravity, 2; hardness = 1; constituents—silica, magnesia, peroxide of iron, and alumina.

VERNON, ROBERT, F.S.A., of Ardington House, Berkshire, and founder of the 'National Gallery' of British Art, was born in 1775. There is little in his private life to interest the biogra-

pher; but in the collection of paintings, which he presented to the British nation, he has left an enduring name. It is sufficient to say, that by a long course of activity and industry in the business to which he applied himself—the breeding of horses—he succeeded in realizing a sufficient fortune to enable him to expend in works of art above 150,000*l.*; and this was not for the mere vanity of buying, but for the encouragement of art; for he always made it a rule to purchase, not from the dealer, but from the artist himself. The so-called 'National Gallery,' with which his name is historically associated, was first established in 1824, by government purchasing Mr. Angeratein's collection of paintings. But the Gallery received very few additions; and not a single British one was purchased. At length Mr. Vernon came forward as the generous patron of Art, and conceived the idea of presenting his rich collection of pictures to the nation, with the view of forming the nucleus of a gallery of British Art. The offer was accepted by the government, and the Vernon Collection, consisting of 157 valuable pictures, was made over, by a deed of gift, in 1847, to the Trustees of the National Gallery. He died in 1849; and since his decease the whole have been temporarily deposited in Marlborough House, Pall Mall.

VETERANS, a term applied to the Royal Veteran battalions, who take precedence, after the foot-guards, of all the infantry regiments of the line. But the officers are not entitled to full retired pay, like those of the regular regiments.

VICAR (Lat. *vicarius* a substitute), a name applied to the incumbent of a parish church, the predial tithes of which have been impropriated, or belong to some religious house, chapter, or layman, who merely allows the vicar a moderate salary, or the profits of the small tithes. He is thus contradistinguished from a rector, who is entitled to the great tithes of the parish.

VICTORIA, or PORT-PHILLIP (formerly known as AUSTRALIA-FELIX), a British colony, situated on the south of the Australian continent, between lat. 34° and 39° S., and lon. 141° and 150° E., having New South Wales on the N.E.; the colony of South Australia on the W.; and Bass's Strait on the S. The territory derived its former name from the noble bay of Port Phillip; but in 1850 the name was changed, in honour of Queen Victoria. Its area is estimated at 79,845 square miles; and its population, at the census of 1851, was 77,345; of which 46,202 were males, and 31,143 females. The principal rivers are the Murray, the Hume, and the Hovell. The territory, from the mouth of the Glenelg River, its western extremity, to Cape Howe on the east, has about 500 miles of coast along the most southerly part of the Australian continent, towards the centre of which is Port Phillip, a magnificent basin about 40 miles in length and breadth. *Melbourne*, situated on the north bank of the Yarra-Yarra river, is the capital of the colony. [MELBOURNE, *Supplt.*]

Geelong, pleasantly situated on the south-western shore of Port Phillip, is the second town of the colony; and has now become an important shipping port; from which runs a railway to Melbourne. The increase of the town of Geelong, since the period of the gold discoveries, may be estimated by the rapid augmentation of the town revenues, which in 1851 were 2785*l.*; in 1852, 10,697*l.*; and in 1854, 241,570*l.* The town of *Ballarat*, the seat of the gold-diggings of that name, contains a large population; and has now become a neat and well-built place. The towns of *Portland* and *Belfast* are also rapidly rising into importance; the former built near the western extremity of the bay of the same name; and the latter, a few miles east of Portland bay. In Bradshaw's 'Monthly Guide to Victoria,' for Feb. 1858, there are 147 places mentioned as post towns.

Thus we find that since the discovery of the gold regions, in 1851, the colony has assumed a vast degree of importance. It is now divided into 23 counties, and possesses a local government and legislature, which is composed of a lieut.-governor, an executive council, and a legislative council of 30 members; 20 elective, and 10 nominees of the crown. According to the census of 1858, the population of Victoria was estimated at 410,766; of which 264,334 were males, and 146,432 females. The population of the diggings was calculated at 166,550.

For the first three months of 1856, the colony exported gold at the rate of 12,000,000*l.* per annum, while in the preceding year the exports of gold were little more than at the rate of half the amount. For the year 1857, the exports amounted to 15,000,000*l.*, and her imports to 17,000,000*l.*, which are larger by far than any other colony of the British empire. Though the population has increased something like 400,000 persons within five years, the live stock has gone on increasing, and the value of exports has, at the same time, been fully maintained. The number of live stock in the colony on the 31st March, 1857, was as follows:—horses, 47,832; horned cattle, 646,613; pigs, 52,227; sheep, 4,641,548. During fifteen months, the increase of live stock amounted to—horses, 14,402; horned cattle, 112,500; pigs, 31,541; and sheep, 63,676.

Since the excitement of the gold discoveries has in some degree subsided, the residents have been able to turn their attention to the nature and productiveness of the soil. On this subject the Quarterly Journal of the Geological Society (vol. ix. p. 75) observes that, owing to the decomposition of volcanic lava in different parts of the Australian continent, a fertilizing influence pervades the soil, especially at the base of the gold-bearing mountains of Victoria, where there stretches 'a fertile and beautiful country, the garden of Australia Felix, the rich soil of which is the product of decomposed lava;' and perhaps for ages after the gold-diggings have been forgotten, these rich plains will continue to yield luxuriant harvests of golden grain to the cultivators of the soil. Already, so far as present experience has gone, the industry and skill of the agriculturists have been handsomely rewarded. During the year 1856-7, the total number of acres under cultivation was estimated at

179,982; and the different kinds of crop sown were as follow:—Wheat, 80,154 acres; maize, 326 acres; barley, 2233 acres; oats, 25,024 acres; potatoes, 16,281 acres. The remainder were either cut for hay, for green food for cattle, or were sown with lucerne, mangold-wurtzel, clover, red beet, tobacco, rye-grass, or garden stuffs. Of these, 50,554 were cut for hay. Produce—1,858,756 bushels of wheat; 8308 bushels of maize; 69,548 bushels of barley; 641,679 bushels of oats; 36,895 tons of potatoes; 790,008 tons of hay; 91 tons of lucerne; 2165 tons of mangold wurtzel; 11 tons of clover; 18 tons of red beet; 650 cwt. of tobacco; 1685 cwt. of onions; 122 tons of carrots; 167 tons of cabbages; and 5078 tons of turnips. The number of acres planted with vines was 279; from which 711,546 lbs. of grapes were sold, 10,936 gallons of wine produced, and 340 gallons of brandy manufactured. The total number of cultivators or occupiers of purchased land was 7253; acres occupied by them, 1,532,348½, of which 1,352,336 acres were held as common pasture land.

VICTORIA, the principal town in the island of Hong Kong, in the Chinese River, which was taken possession of by Sir H. Pottinger in 1843, in the name of the British Sovereign; and so called in honour of Her present Majesty. It stretches for four miles along the north coast of the island, and has numerous storehouses and European dwellings, with Chinese schools, and Roman Catholic and other chapels in abundance. It has been selected as the seat of government.

VICTORIA, the name of one of the counties of the Texas, of which Victoria is the capital.

VICTORIA, the capital city of the State of Tamaulipas, in the republic of Mexico, the population of which is 5500.

VICTORIA, the capital of Vancouver Island, as described in p. 969 of *Suppl.*

VICTORIA REGIA, a magnificent aquatic plant, of the natural order *Nymphæaceæ* (ix. 56), and so named in honour of Her Majesty Queen Victoria. It is a native of Guiana, in South America, where its large spreading-leaves, and immense lily-white flowers, with their beautiful tints and fragrant odours, cover a great surface of the water where they grow. In the hothouses of the Royal Gardens at Kew are to be seen some noble specimens. These Victoria plants were first discovered in the river Berbice, in Guiana, in 1837; by the eminent botanist, Sir Robert Schomburgk; and he thus enthusiastically relates the circumstance:—'While contending with the difficulties that nature opposed in different forms to our progress up the river Berbice, we arrived at a point where the river expanded, and formed a currentless basin. Some object on the southern extremity of this basin attracted my attention. It was impossible to form any idea what it could be; and, animating the crew to increase the rate of their paddling, we were shortly afterwards opposite the object that had raised my curiosity,—a *vegetable wonder!* All calamities were forgotten; I felt as a botanist, and felt myself rewarded; a gigantic leaf, from five to six feet in diameter, salver-shaped, with a broad rim, of a light green above, and a vivid crimson below, resting on the water. Quite in character with the wonderful leaf was the luxuriant flower, consisting of many hundred petals, passing in alternate tints from pure white to rose and pink. The smooth water was covered with the blossoms.'

VIDOCQ, FRANÇOIS JULES, chief of the detective brigade of Paris police, and one of the cleverest thief-takers in all France, was the son of a baker at Arras, Pas de Calais, and born in 1775. He commenced his infamous career by robbing his own father; and after having passed through every grade of crime, as a thief, a gambler, a swindler, and a convicted felon, he was eventually engaged by Henri, as one of the Paris police, in 1813; and soon after became the chief of the detective brigade. From his extensive knowledge of the persons and haunts of the brigands, burglars, thieves, and swindlers of Paris, he was found to be one of the most effective agents for their detection, of which the 'grande nation' could ever boast. In the year 1817 he made 39 seizures of stolen goods, and 772 arrests. Charges having been made against him of inciting to robberies for the sake of arresting his dupes, and sharing their plunder, the government at length became alarmed; and in 1825 he was superseded by Lacour. In 1829 he brought out his autobiography, which was published in Paris in 4 vols.; and to those who feel pleasure in tracing the steps of villany, imposture, cunning, and crime, these volumes may afford some amusement. In 1844 he republished his Mémoires, under the title of 'Les Vrais Mystères de Paris,' in imitation of Eugene Sue's 'Mysteries of Paris.' He died in Belgium in 1850.

VIENNA (xii. 608–10). The modern history of Vienna presents many important features. In 1484 the King of Hungary first established his Court there; and it soon afterwards became the fixed residence of the house of Austria. In 1529, and again in 1683, it was besieged by the Turks; but on the latter occasion it was relieved by the Poles, under Sobieski. It was threatened by Bonaparte in 1797, and captured by him in 1805 and 1809. From November 1814 to June 1815 the celebrated Congress of European diplomatists was here held, which determined the present limits of the boundaries of Europe. In 1848 the city was the scene of general revolt, and was held by the revolutionary party for a considerable time, when it suffered severely from bombardment. The emperor of Austria took to flight, and afterwards abdicated in favour of his son.

Literature and the arts have not been neglected at Vienna. The Imperial Printing Office is one of the most wonderful establishments of that kind in Europe. It is said to employ about 1000 persons; to possess 150,000,000 letter-types; and to print off 300,000,000 sheets of paper every day. There are about fifty steam-printing machines; about the same number of printing presses; sixty-five lithographic and copper-plate presses; ten furnaces for melting type and stereotype metal; with all the appurtenances of a vast

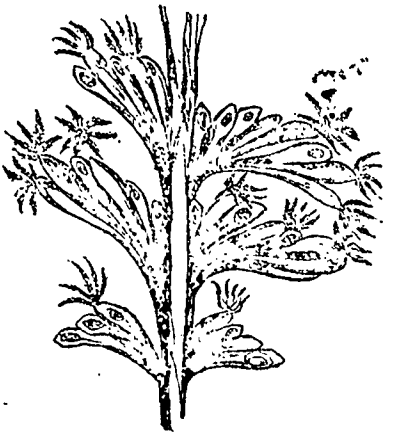
printing establishment. Fine art, as well as science, are here sedulously cultivated. Photography, electrotyping, colour-printing, wood-engraving, and all the kindred arts, are here conducted with consummate skill. At the Great Exhibition of 1851 in London, there was an admirable display of the implements and varied productions of this great establishment. They have been thus described by a contemporary writer:—'There were steel punches for type-letters, comprising the characters for more than a hundred foreign languages, besides mediæval characters and letters for blind persons. There were matrices of Chinese, Japanese, and other peculiar types. There were printed specimens in the principal languages of the whole world. There was the Lord's Prayer, printed with Roman type in 608 languages and dialects, and also in the characters of 206 different nations. There was a copy of Gutenberg's Bible, and specimens of the type used for it. There were copies of books recently printed in the establishment, for various persons, requiring rare or peculiar type. There were large engraved woodcuts, with moulds from them, taken in gutta-percha, and electro-copper casts from the moulds. There were pictures, *chemityped* or etched on zinc, by a chemical process, and capable of being printed at the common press. There were stereotype plates of all the alphabets in the world, with moulds or matrices in gutta-percha, and in plaster, and electro-copper casts from the moulds. There were numerous electro-copper casts from types, woodcuts, petrifactions, bas and alto-reliefs, &c.; besides admirable plates suitable for engravers, and the really wonderful sheet of copper, thirty feet long, produced from a cold liquid solution of copper by galvanic agency. There were numerous chromo-lithographic prints, hung by the side of the original coloured drawings, to which they made a singularly near approach in richness and softness of colouring. There were electro-tint plates, in which the subject is produced by painting and galvanizing, without either etching or engraving, with various minor articles exhibited on the occasion.'

VILLAINS, (low Lat. *villani*), in the feudal ages, were servants of bondmen of base condition, who, like serfs, were the property of the feudal lord, and, as such, mere appendants to the soil [SERFS, *Suppl.*]. They were so named because they usually dwelt in *villages*, and were looked upon as mere slaves, whom the lord might at any time deprive of their goods and chattels, and even administer personal chastisement.—*Villanage* was a base tenure of land or tenements, according to which the tenant was bound to do all such services as the lord required; but those who thus held in villanage were not necessarily villains; for this service could make no freeman a villain. From this system of villanage copyhold tenures appear to have originated; though the slavery of the custom has been long discontinued. By stat. Charles II. the services of villanage were entirely abolished. [SERFS, SERVITIA, *Suppl.*]

VIL'LARSITE, a transparent crystallized mineral, of a yellowish-green colour, found at Traversella, in Piedmont, and so called in honour of M. Villars, a French botanist; hardness = 3·0 to 3·5; composition—magnesia, silica, protoxides of iron and manganese, lime, and potash.

VIREONI'NÆ (Lat. *viridis* green), in ornithology, a sub-family of the *Ampelidæ*, or Fruit-eaters; of which the *Vireo*, or Greenlet, is the type. The larger species resemble Thrushes, and the smaller ones, Warblers.

VIRGULA'RIA (Lat. *virgula* a little rod), a genus of corals, allied to the Pennatula, but destitute of spiny projections. To the genera *Virgularia* and *Pavonaria*, the name of 'ten-rushes' has been applied; the central stem being very much prolonged, and some of them measuring above three feet in length. There is an interesting species called the *Virgularia mirabilis*, of which a magnified representation, showing the polypes, is here given.



VIRGULARIA MIRABILIS.

VISCONTI, M. LOUIS JOACHIM, President of the 'Société des Architectes,' and Member of the French Institute, was born at Rome in 1797. His father, E. Q. Visconti, was director of the Museo Pio Clementino, and a man of distinguished taste in matters of art. In 1799 he was compelled to leave his native city, and removed with his family to Paris, where young Visconti was educated with great care. Having early exhibited a taste for architecture and its sister arts, he was placed under the eminent architect Percier, whose name is intimately associated with the works of the Louvre. While under the tutelage of Percier, young Visconti was honoured with five medals at the school of architecture. He was afterwards made inspector of public buildings, and in 1825 appointed architect of the Bibliothèque Royale. He soon rose to distinction in his profession, and was employed in most of the public monuments with which Paris is adorned. The tomb of Napoleon was designed and executed by him, as well as the monuments of St. Cyr, Marshal Soult, Lauriston, and other distinguished generals. But the work which has most contributed to establish his fame was the noble design, and partial execution of the Louvre, and its connection with the Tuileries, under the patronage

and direction of the present emperor, the first stone of which was laid on the 25th of July, 1852. But unfortunately he did not live to see its completion. He died, from a stroke of apoplexy, on the 29th of December, 1853; and M. Lefuel was appointed to succeed him, who brought this magnificent undertaking to a close in August 1857.

VIVARIA. [AQUARIUM, *Suppl.*]

VIVIANA'CEÆ, a natural order of plants, of which the *Viviania* is the type; so named in honour of Dr. Viviani, a botanist of Genoa. They are inhabitants of Chili and Brazil; and are very pretty shrubs, the flowers of which are of a red and white colour.

VIVIANITE, a crystallized mineral, of a pale green or indigo colour, and vitreous lustre, which is found in Derbyshire and at St. Agnes in Cornwall. Its constituents are—protoxide of iron, phosphoric acid, and water.

VOGEL, DR. EDWARD, an astronomer and man of science, was born at Leipzig in 1829. Here he was educated, and studied astronomy at Berlin, under the celebrated Encke. He was one of the number chosen to make scientific observations in Central Africa in 1853-7. He succeeded in penetrating into the interior, across the great desert, and visited Yacoba in 1855. But in 1856 the British government received intimation of his death; and this melancholy event was fully confirmed by the *Times* newspaper of August 21, 1857, which stated that 'the official confirmation of the murder of Dr. Vogel, at Wara, the capital of Wadai, has just been received. He was beheaded by order of the Sultan.'

VOICE (xii. 660-8). We have already explained the principles on which the *Song-voice* of music, and the *Speech-voice* of oratory, are founded. We now proceed to describe the organs and anatomy of the human voice, and the physiological principles on which its varied tones chiefly depend.

According to Blumenbach, and other distinguished physiologists, the voice is defined as a sound formed by means of expiration in the larynx, which is a beautifully-constructed organ, fixed upon the top of the windpipe. It is composed of various cartilages, combined in the form of a letter-box, and supplied with numerous muscles, which, moving together or separately, produce those wonderful variations of sound, of which the human voice is so capable. Fulgentius considers the voice to be composed of ten parts. 'The first four,' says he, 'are the front teeth, so useful for the appulse of the tongue in forming sounds, without which a mere whistle would be produced instead of a voice. The fifth and sixth are the lips, which he compares to cymbals striking each other; the seventh, the tongue, which serves as a plectrum to articulate sounds; the eighth is the palate, the concavity of which forms the belly of the instrument; the ninth, the throat, which performs the part of the flute, and the tenth the lungs, which supply the place of the bellows.'

The science of anatomy is now better understood than in the times of the old physiologists. The principal organ of the voice may be described as situated on the upper part of the breathing tube, technically called the larynx, which is based upon a cartilaginous substance of a hard and pliable nature; the firmness of which defends the more delicate interior from external injuries, while its pliability allows for expansion and contraction. The principal cartilages of the breathing, or vocal tube, are the thyroid, and uppermost, enclosing the other parts as a shield, which it represents in form; the second called the cricoid, or ring-shaped, enclosed by the thyroid; thirdly, two arytenoid, prism-shaped, like a funnel, which are placed side by side. The base of each is connected with the cricoid by the means of small fibrous bands, and this articulation forms a joint. The tops of the arytenoid are pointed, and have small nodules of cartilage attached to them. All these together form a small box, called the glottis, which opens above into the back part of the mouth, and below into the windpipe. This little box is covered all round by muscles, ligaments, arteries, &c., which, when removed, bring into view the little bands called vocal cords—the instruments of vocal sound. These consist of elastic tissue, varying in length in different people, about nine lines in length in the male, and seven lines in the female. There are four of these cords, two on either side of the glottis, placed in the order of an upper and a lower, the lower called the true vocal cords, because they perform all the duties of speech, and mostly those of song. The upper are seldom used, except by vocalists to produce notes called the falsetto. They are attached in front to the thyroid, and behind to the arytenoid cartilage; their attachment to the latter enables their being brought into the axis of the glottis, so that the air passing up from the lungs can strike against them with great facility between the upper and lower cords. On either side is a little pouch, which secretes a bland fluid, which is poured out at intervals upon the cords, moistens them, and fits them for long-continued exertion, without producing dryness or fatigue. The upper part of the box has attached to it an elastic lid, called the epiglottis. Its use is to cover the organ during swallowing, so as to prevent food going the wrong way. The dimensions of the entire organ of voice are about two inches from above downwards, and one-and-a-half from before backwards, and the same from side to side. The muscles belonging to it are as voluntary as those of our hands, and as much under our control.

All sounds proceeding from the vocal chords, as explained by Fulgentius, undergo considerable modification by the accessories of speech, such as the mouth, cheeks, lips, tongue, teeth, &c., and hence the formation of vocal sounds into articulate words. In those genial climes where man may be said to grow and flourish, the voice is found to be more harmonious and flexible. It there expands, ripens, and grows to perfection; while in the colder and northern regions, where the mouth is more constantly closed, the voice is restricted, and escapes with difficulty. In the beautiful climates of Greece and Italy, the inhabitants have ever been celebrated for the vocal art, both in speaking and singing. But in a climate like ours, where na-

ture has been less favourable, it is seldom we meet with any voices, especially in singing, which are truly excellent. Sometimes the vocal organs are so much contracted that there is not a sufficiently free passage for the expiration of the lungs; and a harsh and disagreeable voice is usually the result. The first and most important operation, in the training of the vocal organs, is to open the mouth so completely that the voice may meet with no obstruction in its course.

Many attempts have been made to imitate the natural organs of the voice by artificial means. M. Kempelon, a Hungarian, succeeded in making a speaking machine: it consisted of a reed, or glottis, or air-chest, with valves, bellows for lungs, and mouth and jaws, and nostrils. It pronounced most of the alphabetic letters perfectly, but D, G, N rather imperfectly. It also enunciated long words and sentences with great facility. The 'Photographic News' gave the details of a very singular discovery, made by Mr. M. L. Scott, by means of which sounds may be made to record themselves, whether produced by the voice in speaking or singing, or by musical instruments. Professor Wheatstone, during a recent visit to Paris, was invited by the Abbé Moigno to inspect the papers on which these sounds had printed themselves, and is said to have been greatly surprised and pleased with what he saw. The mark produced on the paper by a particular note is invariably the same; so, also, if a person speaks, the tone of voice in which he speaks is faithfully recorded.

VOLKON'SKOITE, a mineral found in Siberia, the silicate of chromium, of a green colour, with a conchoidal fracture; the constituents of which are—silica, green oxide of chromium, peroxide of iron, magnesia, and water.

VOLTZITE, a mineral of a yellowish-red colour, and pearly lustre, and so called in honour of M. Volta. It is divisible into thin plates, and occurs with a conchoidal fracture; specific gravity, 3·60; hardness = 4·5. Its constituents are—sulphuret of zinc, oxides of zinc and of iron, and organic matter.

VOLUNTARY, in music, an extempore performance on the organ, intended as a variation or embellishment, during divine service, or more generally at its conclusion. It was originally so called because its performance, or non-performance, was at the option of the organist. Sometimes the Voluntary consists of a written composition, which generally exhibits great freedom of style and manner; but at the same time requires some portion of musical genius to produce the effects intended. This species of music (as Dr. Busby observes) admits of a considerable variety. The change, order, and number of its movements, have never been settled by any law deduced from the authority of particular example, or general usage; consequently much is left to the fancy, taste, and judgment of the composer; and if, in the aggregate, he preserve a sufficient degree of dignity, seriousness, and science, not admitting any lighter ideas, or passages, than are calculated to relieve the more solemn, he may be said to keep within the pale and sacred use for which the organ is so truly fitted and designed.

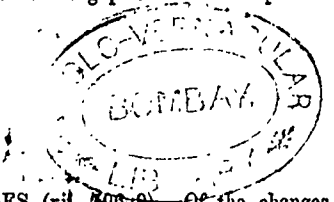
VOL'UNTEER, in military affairs, a term applied to any one who enters into the service of his own accord; and the different corps in which such persons enlist are known as *Volunteers*. During the last war with the French, these regiments were very numerous, and were looked upon as a kind of military reserve for national defence. In the regular army, a volunteer signifies a person who gives his service as a junior officer gratis, that he may establish a claim to a commission without purchase. Captains, subalterns, and staff officers of yeomanry and volunteer corps, class as juniors in their respective ranks with the officers of all other forces. Field officers of the regular, marine, fencible, and militia forces, take rank above all officers of yeomanry and volunteer corps. (*Milit. Encycl.*)

VOLVOX (Lat. a kind of minute caterpillar, from *volvo* to roll), a genus of organic forms, which were classed by Ehrenberg among the animal Infusoria, but which recent researches have discovered to be a species of the vegetable kingdom. For details of these microscopic forms, the reader is referred to the descriptions of Busk and Professor Williamson, in the first volume of the new series of the 'Microscopical Society's Transactions.' Of the three species into which the genus has been divided, the *V. globator*, *V. aureus*, and *V. stellatus*, Busk has thus described the first:—'The more common and best-known form of *Volvox globator*, to the naked eye, or under a low power, appears as a transparent sphere, the surface of which is studded with numerous regularly-placed green granules or particles, and which contains in the interior several green globules, of various sizes in different individuals, though always of uniform size in one and the same parent globe. These internal globes, which are the young or embryo Volvox, at first adhere to the wall of the parent cell, although the precise mode of connection is not very apparent. When thus affixed they are in a different concentric plane to the smaller green granules. At a later period, and after they have attained a certain degree of development, these internal globes become detached, and frequently exhibit a rotatory motion, similar to that of the parent globe.' Mr. Busk then proceeds to describe the other two species just mentioned, which differ very little in structure or character from the preceding.

VOROSMARTY, MICHAEL, one of the most distinguished poets of modern Hungary, was born at Nyer in 1800, and educated for the law but he early adopted literature as a profession; and from 1821 to 1828 there appeared many brilliant productions of his muse. Besides his dramas of 'King Solomon' and 'King Sigismund,' and the romantic poem of the 'Triumph of Fidelity,' he distinguished himself as an epic poet of the highest order, as evidenced by his 'Zalan and Fantasa,' his 'Enchanted Valley,' and his 'Csorhalom,' which were published from 1824 to 1827. He was also editor of the 'Repository of Sciences,' and the 'Athenæum;' and in 1830

became secretary of the Hungarian Academy at Pesth. For one of his lyric poems, written in 1840, entitled the 'Appeal,' which was not unlike the Marseillaise Hymn of France, the Hungarian Academy presented him with a ducat for every line. At the outbreak of the revolution, in 1848, he took a prominent part in the political events of that stirring period. On the unfortunate termination of the Hungarian struggle, he was tried and condemned as a member of the revolutionary committees, but was eventually pardoned. The shock, however, which the event produced on his nervous system, together with the calamities of his unfortunate country, drove him to a state of melancholy, and he died at Pesth in Nov. 1856.

VORTICEL'LA (Lat. *vortex* a whirlpool, from *verto* to turn), a genus of Pedicellate Infusoria, which presents some of the most curious phenomena to be witnessed in the animal kingdom. It belongs to the family of the *Vorticellidæ*, or Bell-animalcules, which are provided with vibratile organs at their anterior extremities; and their rotatory actions produce little *vortices*, or whirlpools, in their vicinity, by which they attract the particles that constitute their food. Of the genus Vorticella, Mr. Dallas has given an interesting account. He describes each of these little creatures as being placed at the top of a long flexible stalk, the other extremity of which is attached to some object. When in activity, and secure from danger, the little Vorticella stretches his stalk to the utmost, whilst its fringe of cilia is constantly drawing to its mouth any luckless animalcule that may come within the influence of the vortex it creates; but at the least alarm the cilia vanish, and the stalk, with the rapidity of lightning, draws itself up into a little spiral coil. But the Vorticella is not wholly condemned to pass a sort of vegetable existence, rooted, as it were, to a single spot by its slender stalk; its Creator has foreseen the probable arrival of a period in its existence when the power of locomotion would become necessary, and this necessity is provided for in a manner calculated to excite our highest admiration. At the lower extremity of the body of the animal, at the point of its junction with the stalk, a new fringe of cilia is developed; and when this is fully formed the Vorticella quits its stalk, and casts itself freely upon its world of waters. The development of this locomotive fringe of cilia, and the subsequent acquisition of the power of swimming by the Vorticella, is generally connected with the propagation of the species, which, in this and some of the allied genera, presents a series of most curious and complicated phenomena.



W.

WAGES (xii. 606-9). Of the changes and fluctuations in the different rates of wages, history records many curious instances. Four centuries ago the amount of wages paid to artizans and labourers was about one-tenth of the sum paid at the present time. This difference is attributable to the then scarcity of money, and its consequent value, when compared with the ordinary necessaries of life and the general cost of materials. There are accounts extant of the expenses of the building of Eton College, temp. Henry VI., in which it is stated that the freemasons received 3*s.* a week each; the stonemasons and carpenters, 2*s.* 6*d.*; and the labourers 4*d.* a day, for working days only; the artizans being allowed for the religious holidays. The prices of articles are also given in these accounts, in which it is stated that ale cost three-halfpence per gallon; four skins of parchment 3*d.*; and glue 8*d.* per pound. The charge for sending a man to London was 2*s.*, which is stated to be at the rate of 8*d.* per day for his necessary expenses, including entertainment for man and horse. The Caen stone, which was imported for building the chapel, cost from 8*s.* to 9*s.* per ton. The ragg stone, which was brought from Boughton, near Maidstone, for the same purpose, cost 1*s.* per ton at the quarry; the carriage to London cost 1*s.* per ton; and the further carriage to Eton cost 1*s.* 4*d.* more. About the latter end of the second year of the building the brick-kiln at Slough was finished. The bricklayers are then first distinctly mentioned in the accounts. They received 6*d.* per day each, with 2*d.* more to Robert Chirche, called the *Warden-layeer and Breke-layeer*. The straw, including carriage, cost some of it 10*d.*, and some 1*s.* per load. The bricks were principally burnt with thorns, but some sea-coal was used, which cost 7*s.* a chaldron. Sand was brought into the college at 1*d.* per load. Many bushels of oyster-shells, at 4*d.* the bushel, were used in the work.

WAGHORN, LIEUT. THOMAS, was born at Chatham, in 1800. In early youth he was destined for the navy. In 1813 he was appointed a midshipman, and when 16 years old he passed in navigation for lieutenant. He shortly afterwards was engaged in the Arracan war, and eventually received the command of the East India Company's cutter, *the Matchless*. After much service he returned to Calcutta in 1827; and it was from that period he directed his attention to the great project of forming a steam communication between India and England. The perseverance with which he worked out the intention, and the important objects effected thereby, have gained him an imperishable name among the benefactors of mankind. He died in 1850.

WAITS, a term which formerly signified *hautboys*, or *oboes*; but after a time the name was transferred from the instruments to the performers, who were originally called *musical*

watchmen. At first they were minstrels, attached to the King's court, who sounded the watch every night; and in towns paraded the streets during winter, to prevent robberies, &c. In 1400 they were appointed with a settled salary at Exeter; and, after having been suppressed by the Puritans, were restored in 1660. The term, in more recent times, was applied to those persons who annually, on the approach of Christmas, saluted the public with their nocturnal concerts—a practice which is continued at the present day.

WALES, PRINCIPALITY OF (xii. 713). According to the census of 1851, the population of the entire Principality was 1,005,721; of which there were 499,491 males, and 506,230 females. Of houses, inhabited and uninhabited, there were 201,419. The following table will present at one view the area in miles, and the population of each county, from 1801 to 1851. The populations of the principal towns are given under each county.

	Area, sqr. Miles	1801.	1911.	1821.	1831.	1841.	1851.
Anglesey....	302	33806	37045	45063	48325	50891	57327
Brecknock..	719	32325	37735	43826	47763	55603	61474
Cardigan ..	693	42956	50260	57784	64780	69766	70796
Carmarthen	947	67317	77217	90239	100740	106326	110632
Carnarvon ..	579	41521	49655	58099	66818	81093	87870
Denbigh....	603	60299	64249	76428	82665	88478	92583
Flint	289	39469	45937	53893	60244	63919	68156
Glamorgan	856	70879	85067	102073	126612	171188	231849
Merioneth ..	602	29506	30854	34392	35315	39332	38843
Montgomery	755	48184	52184	60245	66844	69607	67335
Pembroke ..	628	56298	60615	73789	81425	88044	94140
Radnor	425	19135	20417	22533	24743	25458	24716

Of the state of education in the Principality of Wales, see SCHOOLS, p. 858, *Supplt.*

WALES, NEW SOUTH.' [AUSTRALIA, and VICTORIA, *Supplt.*]

WALHAL'LA, the name of one of the most remarkable architectural monuments of the present day, situated on the north bank of the Danube, near Ratisbon. It is consecrated to the most eminent statesmen, philosophers, warriors, and poets of Germany.

WALLACHIA (xii. 723-6). In 1854 the troops of the Czar of Russia took military possession of Wallachia, as well as of the northern Danubian province of Moldavia. This gave rise to a sanguinary contest between Russia and the allied troops of England and France. [CRIMEA, SEBASTOPOL, &c. *Supplt.*] By the treaty of Paris, the Russians were compelled to evacuate the Danubian provinces, and to renounce all authority over them. It was then settled that the inhabitants of each province should elect their respective Hospodars, or rulers, subject, in some measure, to the authority of the Ottoman Porte. But according to the last news, the two provinces had both elected the same individual, which had given great umbrage, and excited the jealousy of the Porte. Thus the two provinces may now be considered as under one government, and one general head.

WALLOON, or WALLON, the language of the ancient Gauls and Celts, peculiar to the early inhabitants of Hainault, Namur, Luxemburg, Artois, and part of Flanders and Brabant. The Romans having subdued several provinces in Gaul, established prætors, or pro-consuls, &c. to administer justice in the Latin tongue. On this occasion, the natives applied themselves to learn the language of the conquerors, and thus introduced the Roman words and phrases into their own tongue. Of this mixture of Gaulish and Latin was formed a new language, called *Romans*, in contradistinction to the ancient unadulterated Gaulish, which was called Walloon. This distinction is partly kept up to this day; for the inhabitants of several of the Low Country provinces say that in France they speak *Romans*; whereas *they* speak the Walloon, which comes much nearer the simplicity of the ancient Gaulish. (Nuttall's *Class. Dict.*)

WALTER, JOHN, proprietor of the 'Times' newspaper, was the son of Mr. J. Walter, printer to the Board of Customs, and born in 1774. He was the first journalist, as the biographer of the 'Times' observed when noticing his death, who succeeded in imparting to the daily press 'its vast range and celerity of information, its authentic accuracy, its universal correspondence, its lucid arrangement, and marvellous despatch, and, more than all, its dignity in the social scale, and its political position as what has been called the fourth estate of the realm.'

Mr. Walter was the first newspaper proprietor who brought the steam engine to the assistance of the press. He had many difficulties to encounter, but his indomitable perseverance eventually overcame them all. In 1814 the ingenious engineer Kœnig, a native of Saxony, and inventor of the steam printing press, was introduced to him. Mr. Walter entered into the matter with enthusiasm. He was determined to introduce Kœnig's printing machine into the Times' establishment. But, independently of the mechanical difficulties Mr. Walter had to encounter, the most savage and uncompromising opposition existed on the part of his workmen. Yet he overcame every opposition; and printing by steam, on a gigantic scale, was at length brought into successful operation. This may be considered as one of the greatest events in the mechanical history of printing. It has been thus related by the Times' biographer. 'The night on which this curious machine was first brought into use in its new abode was one of great anxiety, and even alarm. The suspicious pressmen had threatened destruction to any one whose inventions might suspend their employment—"destruction to him and his traps." They were directed to wait for expected news from the Continent. It was about six o'clock in the morning when Mr. Walter went into the press-room, and astonished its occupants by telling them that "the Times was already printed by steam." That if they attempted violence there was a force ready to suppress it; but that, if they were peaceable, their wages should be continued to every one of them till similar employment could be procured;' and having so said, he distributed several copies among them. Thus was this most hazardous enterprize undertaken and successfully carried through; and printing by steam, on an almost gigantic scale, given to the world.' [PRINTING MACHINES, *Supplt.*]

The success attending the 'Times,' chiefly owing to the vast mechanical power it had thus obtained, soon raised it above all rivalry. It received the designation of 'the leading journal' of Europe, and its profits, from advertisements and its extensive circulation, became enormous. Its proprietor was enriched accordingly; and after having become proprietor of the fine estate of Bearwood, in Berkshire, he came forward as the representative for the county. He was elected in 1832, and re-chosen without opposition in 1835. In 1841 he was returned for Nottingham; but at the general election which followed he was defeated, and never again entered parliament. On the death of his eldest daughter in 1844, to whom he was greatly attached, he built and endowed a church, within Bearwood domain, for the use of the neighbouring district; and in the churchyard a costly monument has been erected to her memory. His death took place at Bearwood in 1847; and he was interred in the same tomb with his beloved daughter.

WALTZ (German), the name of a fashionable dance, which came from Germany to this country, though originally used in Suabia. The measure of the music is triple time, usually written in $\frac{3}{8}$, and performed in a moderate time. It is still in general use in Germany, and often introduced into concertos, overtures, &c.

WAR. From statistical calculations, it appears that the maintenance of the armies of Europe, even during a time of peace, costs annually 73,313,750*l.*, and of the navies, 17,697,500*l.*; making a total of 91,011,250*l.* Every soldier costs each inhabitant of England, per annum, 12*s.* 6*d.*; of France, 10*s.* 10*d.*; of Russia, 6*s.* 6*d.*; of Austria, 6*s.* 5½*d.*; and of Prussia, 5*s.* 5½*d.* At present (1859) the armies of Europe amount to no less than 5,705,000 men, and the navies to 219,000, making a total of 5,924,000 men, being about fifteen per cent. of the male adult population of Europe withdrawn from the pursuits of industry.

WAR OF SUCCESSION is the name of that memorable contest which was occasioned by the accession of the Duke of Anjou, grandson of Louis XIV. of France, to the throne of Spain, at the commencement of the 18th century. Some of the most illustrious generals of modern times were engaged in this protracted struggle; among others, the illustrious Duke of Marlborough, Prince Eugene, Villars, Vendôme, &c. It commenced in 1701, and terminated with the treaty of Utrecht, Oct. 10, 1711; when the throne of Spain, which had been so fiercely contested, was secured to the quiet possession of the Duke of Anjou, under the title of Philip V.

WARBURTON, E. B. GEORGE, was born in the county of Galway in 1810. He is known in the republic of letters by a popular work, first published in 1845, entitled 'The Cross and the Crescent,' which has gone through several editions. In 1849 he brought out an historical sketch, under the title of 'Prince Rupert and the Cavaliers.' This was followed by 'Reginald Hastings,' a romance; and he shortly afterwards edited the 'Memoirs of Horace Walpole and his Contemporaries.' He also wrote a work, which did not appear till after his death, entitled 'Darien, or the Merchant Prince,' a tale founded on Paterson's unfortunate attempt to form a Scotch colony in the Isthmus of Darien. His end was a melancholy one. He was lost in the ship *Amazon*, which was burnt off the Land's End in 1852.

WARD, ROBERT PLUMER, the author of several works of history and fiction, was the son of a Spanish merchant resident at Gibraltar, and born in 1765. He was educated at Oxford, and in 1790 called to the bar; but he does not appear to have been very successful in his legal vocation. After having filled the office of Under-Secretary of State for Foreign Affairs, he became, in 1807, one of the Lords of the Admiralty, and this office he filled till 1811, after which he was appointed Clerk of the Ordnance. In 1832 he served as high sheriff for the county of Herts. For many years he had a seat in parliament, having been elected in 1802 for the borough of Cockermouth. But his name is best known from its associations with literature, which Mr. Ward found opportunity to cultivate in the midst of his many important duties. The best known of his works, of an historical character, are his 'History of the Law of Nations in Europe, from the Time of the Greeks and Romans to the Age of Grotius,' published in 1795; his 'Inquiry into the Conduct of European Wars;' and an 'Historical Essay on the Revolution of 1688.' But his works of fiction are perhaps better known than those of an historical character, especially his novels of 'Tremaine,' 'De Vere,' and 'De Clifford,' the last of which was published in 1841. He died in Aug. 1846.

It appears that from 1809 Mr. Ward kept a regular 'Diary,' a portion of which has appeared in his 'Memoirs,' published by the Hon. Edm. Phipps, in 1850. It is replete with many curious anecdotes of contemporary statesmen and other public characters.

WARWICKSHIRE (xii. 753-60). According to the census of 1851, the population of the county was 475,013; of which 232,411 were males, and 242,602 females. Of houses, inhabited and uninhabited, there were 88,242. The area of the county was computed at 563,946 acres, or 881 square miles, with 539 persons to each square mile. The population of the principal places was as follows:—

Alcester	2,027	Kingsbury	1,416
Aston manor	6,426	Leamington	15,692
Atherstone	3,819	Monks Kirby	1,899
Bedworth	3,012	Nuneaton	4,859
Berkeswell	1,600	Old Stratford	2,960
Bidford	1,537	Polesworth	2,104
Birmingham	232,841	Rugby	6,317
Bulkington	2,005	Solihull	3,277
Chilvers Coton	2,613	Sowe	1,586
Coleshill	1,980	Stratford-on-Avon	3,372
Coventry mun.	36,208	Studley	2,183
—— parl.	36,812	Sutton-Coldfield	4,574
Erdington	2,776	Tamworth	4,147
Foleshill	7,810	Tanworth	1,892
Hampton-in-Arden	3,094	Warwick	10,973
Kenilworth	3,140		

WASHING MACHINES. Many ingenious contrivances have been brought into operation for the purpose of superseding the manual labours of the lavatory. Among others may be mentioned the 'American Floating Ball Washing Machine,' which first attracted attention at the late Paris Exhibition; and has since been brought into use in this country. It has been thus described by the 'Mechanic's Magazine:'—'A number of wooden balls, more or less, according to the trough in which the clothes are to be washed, are set in motion by a handle worked by a lever, and which agitates an apparatus on which the linen is placed. This movement causes the balls to rub against each other, but only with sufficient percussion to pound the material to be cleansed, and by their eccentric action imitate to a nicety all the routine of a washerwoman's duties. In this way clothes are washed far cleaner than by the ordinary method, and with singular rapidity. The threefold operations of pounding, rubbing, and squeezing are done at the same time; and as the floating balls offer only a limited resistance to each other, the finest fabrics are free from that injury which is consequent upon the ordinary course of proceeding. The wear is, moreover, much less; and not even a button has, it is said, been known to be torn off by the thousands of the machines now in use throughout Europe and America. The consumption of soap is smaller, and no necessity for boiling exists, excepting in the case of extreme foulness. The hands of the operator, which may be a child's, are never immersed in the water, and consequently there is no fear of that blistering, chapping, and bleeding of the fingers attendant upon the poor washerwoman's pursuits.'

At the Wharf Road, City Road, London, there is a Steam-washing Company established for the purpose of working the patent of Messrs. Wallace & Co., of Glasgow. The operations of the steam-washing machine are very complete and effective. The patent was taken out for the union of steam with the dash-wheel, which forms the leading feature in the washing process. Each wheel is divided into four compartments, and each compartment holds 100 shirts, the 400 shirts being washed in thirty minutes. The diameter of the ordinary wheel is six feet and a half; but those for blankets are nine feet, and will hold twenty-five blankets in each compartment; these are cleansed also in about thirty minutes. The shaft is hollow, admitting simultaneously the supplies of steam, soap, and soda, but by different pipes. Each wheel makes twenty-one revolutions in a minute, and the goods enclosed have two falls on each revolution, making forty-two falls per minute. The weight washes the goods.

There is another very useful machine, which is daily exhibited in Pentonville Road, London, called 'Hancock's Washing and Rinsing Machine,' the smallest of which washes nine shirts in from three to ten minutes, or four sheets in five minutes; while the largest machine washes eighteen shirts, or twelve sheets, in the same time. The cost of the machine is from five to ten guineas. It may be described as consisting of a water-tight case, in which rollers are placed near the bottom, carrying an endless canvas band, to which loops are affixed. The articles to be washed are partly drawn through these loops. The rollers press by their weight upon the top of another roller, and consequently upon the articles in the loop, as they travel round with the band. The box or case is filled up to the lower edges of the rollers with hot suds. The revolutions of the rollers are caused by the simple turning of a winch, or handle, which in five or ten minutes effects a thorough washing of the articles as they are driven round the rollers. The machine may be still more simply described as a water-tight box, having three wooden rollers inside, which are set in motion by a small crank. The clothes are put in the box, which is half full of soap and water, and after undergoing a kneading process between the rollers, for eight or ten minutes, they are brought out thoroughly cleansed. The machine can also be worked by steam power.

WASHINGTON, TERRITORY OF [UNITED STATES, *Supplt.*]. The population and prosperity of this newly-formed territory of the United States are rapidly on the increase. In 1850 the population was returned at 1201; in 1855 at 5509; and in 1857 it was estimated at 10,000. At the census of 1850 it formed a portion of the territory of Oregon; from which it was separated by act of Congress in 1853. The great river Columbia belongs equally to Washington and Oregon. [OREGON, *Supplt.*] The territory of Washington is bounded N. by the parallel of 49° N. lat., which divides it from British North America; E. by the Rocky Mountains; W. by the Pacific Ocean; and S. by the territory of Oregon, to which the country of Washington, in its geographical features, bears a striking resemblance.

WASSAIL, the name of a festive song, of Saxon origin, which was sung in the Middle age, from door to door, about the time of Epiphany. The *Wassail Bowl* was the name of a large silver cup or bowl, in which our Saxon ancestors at their festivals drank healths to one another, agreeably to the old Saxon phrase *Waesheal*, health to you.

WATCHMAKING. It is stated that in Switzerland there are no less than 20,000 women who derive their livelihood from watchmaking. By this agency watches are so delicately and cheaply made in Switzerland, that 1,500,000 are annually produced there, besides movements for the American market; while in England the number has been computed only at 186,000.

WATER (xii. 769–72), and its IMPURITIES. Public attention has of late years been directed to the supply of pure and filtrated water for general use, especially in the Metropolis and other large towns. This may be looked upon as the principal agent in the preservation of health, and very large sums have been expended in affording supplies of pure water to every part of London. It is stated that the engineering works for the purpose have cost no less than 2,282,824*l.*, of which the New River Company has expended 566,084*l.*, and it is believed that the improved sanitary condition of the population is chiefly at-

tributable to the improved management and filtration of the water.

In a late report of the General Board of Health, there appeared a comparison of the amount of organic matter discoverable in the water supplied in 1851, and that with which the public are served at the present time. The results of 1851 and 1856, calculated in grains per gallon of organic matter, are thus given :—

	1851.	1856.
Grand Junction . .	3·07	1·38
West Middlesex . .	2·73	0·96
Chelsea . . .	2·38	1·42
Southwark and Vauxhall	1·51	1·37
Lambeth . . .	2·59	1·33
New River . .	2·79	0·968
East London . . .	4·12	1·09

Kent Company, one-half in favour of 1856.

The New River water forms the general supply of the district of Islington; and, on the whole, it is, perhaps, one of the best kinds of water to be had as yet in London. Dr. Griffith considers the amount of organic matter it contains to be as small as possible. The water, after being filtered in the New River reservoir, is clear and sparkling. To this, possibly may be attributed the healthy condition of the locality, as compared with many other districts.

The evil effects of impure water were demonstrated at a meeting of the British Association, when Dr. Lankester exhibited some water taken from a well at Cirencester, which had been the cause of severe illness in a family. Although at first clear, after a little time it exhibited the mycelia of a fungus. This water had been sent to him for examination, and he had been struck with the resemblance of the fungus to that of one which he had found in the well-water of Broad Street, Golden Square, the drinking of which had been connected with the outbreak of cholera in that district in 1854. This well had subsequently been found to have received into it the contents of house drainage. He had now discovered that the well at Cirencester had also received into it a certain amount of house drainings. He related other cases in which fungi appeared in contaminated water. None of the waters mentioned exhibited any injurious constituents that could be discovered by chemical analysis. Before chemistry could detect them they had lost their injurious properties, and the microscope alone could realize their presence.

On the frequent impurities and unwholesomeness of well-water, Dr. Johnston, in his 'Chemistry of Common Life,' makes some valuable practical remarks :—'As the solvent power of water enables it to take up many substances from the rocks and soils through which it passes, it often happens that in the neighbourhood of dwellings and farm-yards, and especially in towns, the water of wells becomes very impure, and even unwholesome drink. The rains that fall upon the filth that accumulates in towns wash out the soluble substances it contains, carry them into the soil, and through this by degrees to the wells by which the wants of the inhabitants are supplied. This has often been productive of serious and fatal disease. It shows, therefore, the propriety of preventing, as far as possible, the accumulation of refuse, and, where such accumulation is unavoidable, of placing it at the greatest distance from wells, which yield water for daily use. And, especially, it shows the necessity of bringing water from a distance for the supply of large cities. The neighbourhood of graveyards is equally liable, with the accumulation of town refuse, to adulterate water with undesirable admixtures.'

Dr. Marcet lays down the following practical rules for testing the purity and wholesomeness of water. In the first place, the water must be perfectly colourless and transparent, leaving no deposit when allowed to stand undisturbed;—it must be quite devoid of smell;—when litmus paper is immersed in the water, the colour of the paper must remain unaltered;—the water when boiled must not become turgid;—about half a table-spoon of the fluid being evaporated to dryness on the spirit-lamp, there must be a slight residue left at the bottom of the spoon not turning black from organic matters.

WATER-BED, a bed constructed for invalids, on hydrostatic principles, by the eminent physician Dr. Arnott. It consists of a large sheet of waterproof India-rubber cloth floating on a bed of water, which is now very generally used in hospitals and sick chambers, and known as 'Arnott's hydrostatic bed.'

WATER-ORGAN. [HYDRAULICA, *Suppl.*]

WATER-WORKS, the name given to such works as are employed for sustaining or raising water, as water-mills, sluices, wheels, or other hydraulic apparatus. The term, however, is more specifically applied to works erected for the purpose of supplying large towns with water for the regular use of the inhabitants.

WATERFORD, County of, Ireland (xii. 775–77). According to the census of 1851, the population was 164,051; inhabited houses, 25,367. The area of the county was 721 square miles, or 461,553 acres, of which 325,345 were arable, 23,048 in plantations, and 105,496 uncultivated. The population of the principal places was as follows :—

Cappoquin . .	2,144	Lismore . . .	2,319
Carrickbeg . .	2,108	Passage . . .	664
Clonmel (part in Tipperary) .	12,386	Portlaw . . .	4,351
Dungarvon . .	6,865	Tallow . . .	1,986
Kilmacthomas .	1,057	Tramore . . .	1,882
		Waterford . .	25,297

WEALDEN FORMATION (Dutch, *weald* a forest), in geology, a series of fresh-water deposits, of the secondary epoch, in the Wealds of Kent and Sussex. The upper beds of this extensive formation are known as the *Weald clay*. It consists of a tenacious blue clay, containing beds of sandstone and shelly limestone, which form the upper subsoil of the Wealds of Kent and Sussex. The middle beds of this formation are known as the *Hastings* sands, which consist of different coloured sands, with friable sandstones passing into limestone. The Ashburnham

beds, or Purbecks, are constituted of grey limestone, with sandstone, shale, and blue clay. The total thickness of these deposits averages about 2000 feet. They extend for about 220 miles from north-west to south-east, and are 200 miles in length, from east to west. The Wealden is supposed to have formed the estuary of an immense river, the deposits of which are numerous and interesting. The organic remains consist of enormous reptiles, which are now extinct, fishes, turtles, crocodiles, birds, &c. The vegetable fossils consist of the leaves, stems, and branches of trees, and appear to have been of a tropical character.

WEIGHTS and MEASURES (xii. 816–21). Under the article 'Decimal System of Weights and Measures' (*Supplt.*), we have briefly adverted to the great convenience likely to arise from a general system of decimality in weights and measures, as well as in the monetary transactions of life. Its advantages are now becoming so manifest, that a very short period must elapse before it is universally adopted. But governments are slow in all social movements of a progressive tendency, unless the impulse is given by the people themselves. At Liverpool, however, the decimal system has been lately carried into operation, so far as regards the important article of corn, —the weights and measures of which are so uncertain throughout the country. This new standard of decimality was established by the Association of the Liverpool Corn Trade on the 1st of February, 1859. But to meet the difficulties which might at first be experienced in ascertaining the value of the usual measures of grain, meal, or flower, they have adopted what is called the 'Cental Ready Reckoner,' in which is computed and published a complete list of new corn tables,—the 'cental' being estimated at 100 lbs. These tables are intended to enable buyers and sellers to communicate with all other markets, where the old standards of weight or measure may be still maintained.

The decimal system of weights and measures is also becoming very general on the Continent of Europe. Prussia, by a general law, has introduced into her home trade the pound of 400 grammes; and the convention of the Northern States divides the pound in such a manner as to be, with the exception of names, the full and entire adoption of the French system. The States that signed this convention engaged, that from the 1st of July, 1858, no other weight but this new one should be allowed on their territories. A convention signed at Hanover also adopts the pound of 500 grammes as the unity of weight; and this convention not only embraces the kingdom of Hanover, but the duchies of Brunswick and Oldenberg, the principality of Schauenbourg, and the free cities of Bremen and Hamburg. For some time past the pound of 500 grammes has been the unity of weight in the Zollverein, but only for international relations; that is to say, for the commerce of the States of that union, amongst themselves and with foreign countries; each State in its internal trade retaining its old system.

WELLINGTON, ARTHUR, DUKE OF, the illustrious commander-in-chief of the British army, and conqueror of Napoleon Bonaparte, was the fourth son of Garret, second Baron and first Earl of Mornington, and born in Dublin in 1769. His paternal ancestors were the Colleys, of Castle Carbery, a family founded by Walter Cowley, solicitor-general of Ireland in 1537. But all the honours and distinctions of family ancestry sink into insignificance when compared with those of the illustrious duke, whose titles and honours were numerous as his deeds, and brilliant as his renown. But in the prescribed space to which we are here confined, we can do little more than briefly advert, in chronological series, to the more prominent phases of his glorious career. To give a perfect biography of this distinguished soldier would be to write the history of Europe for more than half a century. His deeds are matters of universal history; and therefore belong more to the historian than the biographer.

The name of 'Wesley' was first adopted in 1728, by the duke's grandfather, Richard Colley, Esq. (afterwards first Lord Mornington), on succeeding to the estates of Garret Wesley, Esq., whose mother was a Colley. As 'Arthur Wesley' the young soldier obtained his first commission in 1787; and it was not until 1797 that the spelling of the name was changed to Wellesley by the late Lord Wellesley, on his lordship being created a Marquis. In 1791 young Wellesley was promoted to a company in the 58th Foot; and in 1792 obtained a troop in the 18th Light Dragoons. At this eventful period the war of the Revolution was raging, and the Republican armies had been increased to nearly half a million of men. As lieutenant-colonel of the 33rd Regiment of Foot, Wellesley was actively engaged in the Netherlands, under the Duke of York, and there highly distinguished himself in various encounters. In April 1796 he sailed with his regiment for India. Tippoo Sultan was then endeavouring to influence Zemaun Shah to make a diversion on the northern frontier of the English territory, and pressing the Mahratta powers to join the league, and make common cause against the British. Under all the circumstances the Governor-general was induced to issue a declaration of war on the 22nd of February, 1799. During the severe contests which ensued, the 33rd Regiment was actively and gallantly engaged with the sultan's troops, until Seringapatam, the capital of Tippoo Saib, was eventually carried by storm, and the sultan slain. In 1799 Wellesley was vested with the command of the Mysore country; and, as Major-general, in 1803 he fought the celebrated battle of Assaye, when with 8000 men he routed the forces of Scindia, consisting of 60,000, which at once terminated the war, and made General Wellesley the hero of India. In 1805, having become Sir Arthur, he returned to his native land; and in 1806 married Catherine, the third daughter of Lord Longford.

The eventful drama of Sir Arthur Wellesley's life was now about to open. Napoleon was at the very summit of his glory, and had seized Spain and Portugal. An expedition was then planned by the British government to afford relief to the oppressed inhabitants of the Peninsula.

Sir Arthur was appointed to the command, and in 1808 he landed with his troops at Mondego Bay, where he had to encounter the forces of the celebrated Junot. The vexations and disappointments which Sir Arthur had there to encounter, owing to the incompetency of Generals Burrard and Dalrymple (the officers who had been placed over him), are matters of history. He was obliged to throw up his command, and then returned to England. The Convention of Cintra, for enabling the French to evacuate Portugal, had ruined everything.

After the defeat of Sir John Moore, and when the affairs of the Peninsula were at the worst, Sir Arthur Wellesley, in 1809, was appointed to the chief command of a strong reinforcement, which was destined to operate in the Peninsula. From the period of his arrival affairs appeared to take a new turn. He effected the passage of the Douro, and succeeded in defeating the forces of Generals Soult, Victor, Jourdan, and other distinguished French officers, for which services he was created Baron Douro, of Wellesley, and Viscount Wellington, of Wellington, county Somerset. His next operations were against Marshals Ney and Massena; when at the lines of Torres Vedras, at Ciudad Rodrigo, at Badajos, at Salamanca, at Burgos, at St. Sebastian, and numerous other places, he pre-eminently distinguished himself, until he ultimately succeeded in expelling the French armies from the soil of the Peninsula. For these glorious deeds in 1814 he was honoured with the dignity of a dukedom, and a Parliamentary grant of 400,000*l.*

The memorable battle of Waterloo, in June 1815, after the escape of Napoleon from Elba, was the crowning triumph of the illustrious duke's military glories. He there signally defeated the great conqueror of Europe, and for ever annihilated his political career.

On the termination of his military life the Duke soon became intimately associated with the political movements of his country, and held many high and important positions; but his qualities as a statesman bore little comparison with those of his military profession. In 1819 he was made Master-general of the Ordnance, and took a seat in the Cabinet. In 1826 he succeeded to the post of commander-in-chief. On the death of Canning he was appointed Prime-minister of England. In 1829, in conjunction with Sir Robert Peel, he introduced the bill for the relief of the Roman Catholic Disabilities, and eventually carried it through Parliament. But his resistance to the Reform Bill was the cause of his overthrow. He was then succeeded by a Whig government, which held office for ten years. In 1845 the Duke co-operated with Sir Robert Peel in the repeal of the Corn Laws, which may be considered as the crowning act of his political life. He afterwards took little part in public affairs, but lived in comparative retirement. He died at Walmer Castle, Sept. 14, 1852, aged 83. His remains were honoured with a public funeral, at the public expense; and he was interred in St. Paul's Cathedral, in the same vault with Lord Nelson.

WELLS, IMPURITIES OF. [WATER, *Suppl.*]

WESLEYAN SCHOOLS. [SCHOOLS, *Suppl.*, p. 858.]

WESTALL, WILLIAM, brother of Richard Westall, and like him an eminent artist, was born at Hertford in 1782. In early life he evinced a strong predilection for landscape painting, and accompanied Captain Flinders in his circumnavigation of the globe. Of the three painters who went round the world with Cook, Vancouver, and Flinders, viz. Hodges, Webber, and Westall, 'the last,' says Mr. Landseer, 'was the most accomplished; and his delineations of what he saw had most of the truth of portraiture, as the engravings in Captain Flinders' book will show.' On his return to England, Mr. Westall opened an exhibition in Brook Street, consisting of representations of the principal objects he had witnessed when abroad. In 1811-14 he published a pictorial work in folio, consisting of a 'Series of Views of picturesque and romantic Scenery in Madeira, the Cape of Good Hope, Timor, China, Prince of Wales' Island, Bombay, Mahratta country, St. Helena, and Jamaica; engraved by Heath, Woolnoth, and Cook, with Descriptions.' In 1813 he was elected an Associate of the Royal Academy. In 1818 he brought out his 'Views of the Caves near Ingleton, Gordale Scar, and Malham Cove, in Yorkshire;' the engravings, as well as the drawings, being executed by himself. He was also the author of 'Britannia Delineata,' 'Views in London and its Environs' (1825), and 'Picturesque Tour of the Thames.' He died in London, in 1850.

WESTMACOTT, SIR RICHARD, R.A., Professor of Sculpture in the Royal Academy, was born in London in 1775. His father was a statuary in Mount Street, Grosvenor Square, where young Westmacott acquired the first practice and principles of his art. In 1793 he was sent to Rome, and studied under the celebrated Canova. He there produced a relievo representing a scene in the history of 'Joseph and his Brethren,' which obtained him the Pope's first gold medal of the year for sculpture. In 1798 he returned to England, where he steadily rose in his profession, and was engaged in many public works of art. Among others may be mentioned the monuments of Sir Ralph Abercrombie and of Lord Duncan, in St. Paul's Cathedral. Indeed this edifice may be consulted as a kind of artistic gallery for the works of Westmacott. In 1805 he was elected an Associate of the Royal Academy, and a full member in 1816. In 1827 he succeeded Flaxman as lecturer to the Academy in Sculpture, which office he retained till his death. In the same year he received the honour of Knighthood, and was presented with the honorary degree of D.C.L., by the University of Oxford.

The works of art which Westmacott executed for private collections are almost innumerable; among others may be noticed his 'Cupid and Psyche,' executed for the late Duke of Bedford; 'The Houseless Traveller,' in the collection of the Marquis of Lansdowne; 'Euphrosyne,' executed for the late Marquis of Westminster; 'Monument to the Memory of the Countess of Rochsavage,' where angels are represented as guardians of the

departed spirit. He also designed and executed the colossal statue of 'Achilles' in Hyde Park; the figures of the Duke of Bedford in Russell Square; of Charles James Fox, in Bloomsbury Square; of Lord Nelson, in the Liverpool Exchange; of Lord Erskine, in Lincoln's Inn Old Hall, besides statues of Addison, Pitt, and other distinguished characters. Among his later works of importance may be noticed the group of Sculpture which occupies the pediment of the British Museum, in which, for the first time, he ventured to introduce polychromy into the façade of a monochrome edifice, by gilding some of the ornaments, and giving an azure tint to the tympanum of the pediment.

Sir Richard Westmacott, being a member of the council of the Royal Academy, took an active part in all its proceedings till within a very short period of his death. He died in South Audley Street, London, in September 1856, aged 81.

WESTMEATH, County of, Ireland (viii. 430–32). According to the census of 1851, the population was 111,409; inhabited houses, 24,002. The area of the county was estimated at 708 square miles, or 453,408 acres, of which 365,218 were arable, 8,803 in plantations, and 56,392 uncultivated. The population of the principal towns was as follows:—

Athlone . . .	6207	Mullingar . pa.	9903
Moate . . .	1977	——— . t.	5516

WESTMORELAND, County of (xii. 841–6). According to the census of 1851, the population was 58,287; of which 29,079 were males, and 29,208 females. Of houses, inhabited and uninhabited, there were 11,750. The area of the county was computed at 485,432 acres, or 758 square miles; comprehending 77 persons to each square mile. The population of the principal places was as follows:—

Ambleside . .	1,592	Holme . . .	1,154
Appleby, St. Michael . .	1,262	Kendal . . .	11,829
Appleby, St. Lawrence .	1,453	Kirkby Lonsdale . . .	1,675
Brough . . .	1,533	Kirkby Stephen	1,339
Burton in Kendal . . .	2,559	Kirkland . .	1,139
Heversham . .	1,534	Orton . . .	1,456
		Shap	1009
		Undermilbeck .	1,421

WEXFORD, County of, Ireland (xii. 848–52). According to the census of 1851, the population was 180,154; inhabited houses, 33,507. The area of the county was estimated at 900 square miles, or 576,588 acres, of which 510,702 were arable, 14,325 in plantation, and 45,500 uncultivated. The population of the principal places was as follows:—

Enniscorthy .	6,095	New Ross . pa.	9,131
Ferns . . pa.	2,860	——— bor.	7,778
——— . . t.	632	Newtownbarry	1,307
Gorey . . .	2,973	Wexford . bor.	12,471

WHEAT, and other CEREALS. [CORN, and CORN TRADE, iv. 951; xii. 861–2.] The heavy import duties on wheat, and every kind of grain, were happily repealed in 1846, and altogether ceased in 1849, with the exception of 1*s.* duty per quarter for the purpose of registration. Since that period the prices of wheat, each year dating from Michaelmas 1846, have been as follows:—1847 (ending at Michaelmas), 71*s.* 3*d.*; 1848, 51*s.* 3*d.*; 1849, 46*s.* 7*d.*; 1850, 40*s.* 3*d.*; 1851, 39*s.* 5*d.*; 1852, 39*s.* 10*d.*; 1853, 45*s.* 7*d.*; 1854, 72*s.* 10*d.*; 1855, 71*s.* 10*d.*; 1856, 73*s.* 1*d.*; 1857, 59*s.* 2*d.*

The importations from various parts of the globe have been extensive; and afford satisfactory proofs of the impolicy and injustice of levying heavy imposts on the staff of life, when our own country is utterly incapable of producing sufficient for the national consumption. In 1858 the quantity of grain and flour imported amounted to 11,291,713 quarters, more than 20,000,000*l.* in value; nearly the whole of which was received in exchange for the products of our manufacturing industry.

WHEATON, HENRY, the American writer, and diplomatist, was born at Providence, Rhode Island, in 1785. He was educated for the law, and early became a member of the bar. In 1812 he was appointed editor of the 'National Advocate;' and contributed to it many valuable articles on the law of nations. About 1815 he was appointed reporter to the Supreme Court of the United States. His reports, which were published in 12 vols., are considered of great authority. About this time he received many literary and political distinctions; and in 1825 was appointed a commissioner for revising the laws of the State of New York. He was afterwards appointed, by President Adams, to the office of Chargé d'Affaires at Copenhagen, and next at the Court of Berlin. In 1831 he published the result of his researches in Scandinavian literature and history, in a work entitled 'The History of the Northmen, or Danes and Normans, from the earliest Times.' He also wrote a history of Norway, Sweden, and Denmark, under the title of 'Scandinavia.' In 1836 appeared the most important of all his literary productions, 'The Elements of International Law,' which still ranks as a standard work in that branch of juridical literature, and several editions have been since published. In 1837 Mr. Wheaton was appointed minister plenipotentiary to the Court of Prussia, which high position he maintained with great distinction, until recalled by President Polk in 1846. He died in 1848.

WHISKEY (xii. 872). The consumption of whiskey in Scotland, in 1851 and 1852, was 13,828,539 gallons, which, at 6*s.* 6*d.* per gallon, amounted to 4,494,274*l.* In 1857 and 1858, the consumption was 13,975,226 gallons, with 2,000,000 gallons for water added more than in the two preceding years, which, at 11*s.* 2*d.* per gallon, amounted to 8,919,508*l.*; making a difference of 4,425,234*l.*

WICKLIFFITES, a religious sect of the 14th century, who were so called from John Wickliffe, or Wycliffe, to whom the first dawnings of the Reformation in this country are attributable. [WYCLIFFE.] This sect maintained, among other things, that the substance of the sacramental

bread and wine remained unaltered after the consecration. They also strongly opposed the doctrine of indulgences, purgatory, the invocation of saints, and the worship of images. So prevalent did these doctrines become, and so numerous were the followers of Wycliffe, that forty years after his death they were condemned by the Council of Constance. The bones of Wycliffe were disinterred and burnt, and the ashes cast into the river Swift.

WICKLOW, County of, Ireland (xii. 883-6). According to the census of 1851, the population was 98,978; inhabited houses, 21,182. The area of the county was computed at 782 square miles, or 500,178 acres, of which 280,393 were arable, 17,600 in plantation, and 200,745 uncultivated. The population of the principal places was as follows:—

Arklow . . .	3300	Rathdrum . .	3331
Baltinglass . .	4168	Wicklow . . .	2946
Bray	3152		

WIDIN, the capital of Upper Bulgaria, situated on the right bank of the Danube, about 130 miles E.S.E. of Belgrade. In 1853-4, it was fortified and strengthened by the Turks, as a defence against the Russians. Its population is about 26,000, consisting chiefly of Turks, Armenians, and Greeks.

WIFE and HUSBAND. [DIVORCE, *Supplt.*]

WIFFEN, JEREMIAH HOLME, author of 'Aonian Hours,' was born near Woburn, of Quaker parents, in 1792. He followed the profession of a schoolmaster for many years, when he was in the habit of indulging his literary tastes by the production of various brochures, chiefly of a poetical character. But after the publication of his 'Aonian Hours,' in 1819, the Duke of Bedford, whose attention the poem had attracted, took him under his ægis, and made him librarian at Woburn, as well as his private secretary. He had now ample opportunity and leisure to pursue his literary tastes; and he brought out in succession the following works:—'Julia Alpinula, the Captive of Stamboul' (1820); translations, in Spenserian stanzas, of Garcilaso de la Vega (1822), and of Tasso's 'Jerusalem Delivered' (1830); 'Historical Memoirs of the House of Russell' &c. He died at Woburn Abbey in 1856.

WIGTONSHIRE, Scotland (xii. 895-7). According to the census of 1851, the population of the county was 43,389; and the inhabited houses 6902. The area of the county was computed at 511 square miles, or 326,736 acres, of which about 100,000 are arable. The population of the principal places was as follows:—

Newton Stewart	2599	Stanraer . mun.	3877
Port-Patrick pa.	1963	Whithorn . .	1052
Stanraer . parl.	5738	Wigton . . .	2121

WILL and TESTAMENT (xii. 902-7). Probates of wills, and the right of granting letters of administration, have been removed from the ecclesiastical jurisdiction to the general 'Court of Probate,' established by stat. 20 and 21 Vict. c. 77. [PROBATE, COURT OF, *Supplt.*] Stat. 15 and 16 Vict. c. 24 was enacted to provide for the consequences arising from the negligence of testators in not strictly attending to the provisions of the 'Wills Act' of 1 Vict. c. 26, respecting the proper signing of these instruments. A will must be drawn up in clear and simple language, and signed at the end by the testator, in the presence of two or more witnesses; and if written on more than one sheet, testator and witnesses are required to sign each sheet. The witnesses must be parties not interested in the Will; and in all cases where a name is given, the Christian and surnames, residence, and profession must be fully and clearly described. The signature of the testator must be acknowledged by him in the presence of the witnesses. After having signed the Will he must take it in his hand and say, 'I acknowledge this to be my last will and testament, and request you to sign it.' The form of the will is as follows, or to the same effect:—'This is the last will and testament of me, A. B. —— of ——. After payment of all just debts, funeral and testamentary expenses, I give and bequeath unto C——, also to D——, &c. And as to the residue and remainder of all my real and personal estate, I give, devise, and bequeath the same unto ——. And I hereby appoint —— and —— executors of this my will, as witness my hand this day of 18 .'

If the residue of an estate is not provided for, it becomes the property of the next of kin. If any obliterations or alterations are made in the will they must be signed by the testator and witnesses in the margin as near the alterations as possible. It is not necessary for a witness to know the contents of a will. Marriage, after making a will, makes the will null and void.

WILLIAM II. (FRED. GEORGE LOUIS), late King of the Netherlands, bore an important part in many of the great events of the present century; and is best known in England as having been the intended consort of Princess Charlotte of England. He was born December 6, 1792; and educated in the military college of Berlin. His first campaign was with the English army in Spain; and the Duke of Wellington made him his aide-de-camp. He was engaged at the siege and storming of Ciudad Rodrigo, and Badajoz, and distinguished himself at the battle of Salamanca. On the restoration of his father to the throne of the Netherlands, in 1814, the Prince was received both by the Dutch and the Belgians as their future sovereign. He was present at the battle of Waterloo, and there wounded at the head of his troops. At the Congress of Paris, that soon afterwards followed, and at which he attended, the proposal was made for his alliance with the Princess Charlotte of England; but on its failure he married Anna Paulowna, sister of the Emperor Alexander of Russia. The revolution of 1830 effected a great change in the territorial division of the Netherlands. On the revolt of the Belgians, Prince William, who was a great favourite with all parties, exerted himself to effect a reconciliation; and even went so far as to acknowledge the independence of Belgium, for which act his father dismissed him from the service. In the succeeding year, however, he was invested with the command of the Dutch forces in

the short war with Belgium, and though at first victorious, the contest was ultimately settled by the armed intervention of the French. On the abdication of his father, in 1840, he succeeded to the government, which, although opposed to every species of constitutional reform, he conducted with great prudence and ability. But on the breaking out of the revolution of 1848, he was compelled to submit to many political changes, of a highly liberal tendency, which a few moderate concessions previously made might perhaps have avoided. He died in March 1849.

WILSON, JOHN, Professor of Moral Philosophy in the University of Edinburgh, was born at Paisley, in 1785. At the early age of 13 he was sent to the University of Glasgow, and five years afterwards was entered of Magdalene College, Oxford. After taking several college honours he graduated B.A. in 1807, and M.A. 1810. His father having purchased an estate on the margin of Lake Windermere, in Westmoreland, young Wilson became a denizen of the Lake country, and there became acquainted with Wordsworth, Coleridge, Southey, and De Quincy. In 1812 he distinguished himself as a poet. He published 'The Isle of Palms, and other Poems,' and this was soon followed by 'The City of the Plague,' a poem distinguished for beauty of expression and delicacy of sentiment. In 1817 Blackwood's Magazine was commenced, and Wilson was added to the staff, when he wrote a series of articles, which mainly contributed to the fame of that popular publication. On the death of Dr. Thomas Brown, in 1820, he was appointed Professor of Moral Philosophy in the University of Edinburgh; and his success in the chair was such as to disarm his enemies, and delight his friends. He afterwards devoted himself to novel writing, and produced three works of powerful interest, 'Lights and Shadows of Scottish Life,' 'The Trials of Margaret Lindsay,' and 'The Foresters;' which greatly contributed to enhance his literary fame. In 1826 Wilson succeeded Mr. Lockhart in the editorship of Blackwood's Magazine; and the 'Noctes Ambrosianæ' were among the powerful effects of his pen. In 1842 he published a selection of his contributions in 3 vols. under the title of 'Recreations of Christopher North.' In 1853, owing to general infirmity, and increasing bodily weakness, he was obliged to resign his professorial chair in the Glasgow University; and a pension of 200*l.* was granted him by Lord John Russell. He died at Edinburgh, in 1854.

WILSON, GENERAL, SIR ROBERT T., was the son of Mr. Benjamin Wilson of Bloomsbury, London, and born in 1777. He was educated at Westminster, and entered the army at a very early age. In 1794 he obtained a commission in the 15th Dragoons. He served in Ireland during the rebellion of 1798, and afterwards in Holland. In 1800 he obtained a majority in Hompesch's Mounted Rifles. After having served in Brazil and the Cape of Good Hope, he was appointed to the command of a Spanish brigade under Sir Arthur Wellesley. From 1812 to 1814 he was actively engaged, and distinguished himself on many occasions by his skill and bravery. After the defeat of Napoleon at Waterloo he involved himself in difficulties by aiding in the escape of Lavalette, who had been sentenced to death on the charge of being an accomplice of Napoleon's after his flight from Elba, and suffered some months' imprisonment. His conduct on the occasion of the funeral of Queen Caroline entailed the censure of the British government; when he was dismissed the service, and deprived of the foreign orders which had been conferred upon him for his gallant deeds. But the public espoused his cause with great enthusiasm, and subscribed a sum sufficiently large to compensate him for the loss of his commission. In 1818 he was elected member for Southwark in the liberal interest, and retained his seat till 1831. After the accession of William IV. he was restored to his honours. In 1841 he received the rank of general; and afterwards, from 1842 till 1849, he held the post of governor and commander-in-chief of Gibraltar. He died, soon after his return to England, in May 1849. The talents of Sir Robert Wilson were not confined to military matters; he was author of several works which have established his reputation in the republic of letters; among others, may be mentioned his 'Historical Account of the British Expedition in Egypt,' 'An Inquiry into the Military Force of the British Empire' (1804), and 'A Sketch of the Military Power of Russia,' which was published in 1817.

WILTSHIRE (xii. 917–25). According to the census of 1851, the population of the county was 254,221; of which 125,728 were males, and 128,493 females. Of houses, inhabited and uninhabited, there were 53,917. The area of the county was computed at 865,092 acres, or 1352 square miles, with 188 persons to each square mile. The population of the principal places was as follows:—

Aldbourn	1,622	Malmsbury	6,998
Alderbury	1,438	Melksham	2,931
Bedwin (Great)	2,193	North Bradley	2,298
Bishops Cannings	3,925	Pewsey	1,921
Box	1,987	Purton	2,033
Bradford	4,240	Ramsbury	2,696
Bremhill	1,421	Salisbury	11,657
Bromham	1,619	Sherston Magna	1,589
Calne . mun.	2,544	St. Edmund	4,187
—— . parl.	5,195	St. James, or Southbroom	2,517
Chippenham m.	1,707	St. Martin	2,971
—— parl.	6,283	St. Thomas	2,359
Corsham	3,172	Steeple Ashton	1,857
Cricklade	35,503	Stratton St. Margaret	1,725
Devizes	6,554	Swindon	4,876
Donhead St. Mary	1,621	Trowbridge	10,157
Downton	2,727	Warminster	4,220
Fisherton Anger	1,905	Westbury	7,029
Heytesbury	1,210	Westport St. Mary	1,661
Highworth	4,026	Wilton	8,607
Laycock	1,653	Wootton Basset	2,123
Marlborough m.	3,098	Wroughton	1,645
—— parl.	5,135		

WINDING-UP ACTS (JOINT-STOCK COMPANIES, vii. 638-9). In 1844 an Act was framed for the incorporation of Joint-Stock Companies, which was afterwards amended in 1848. In 1854 the 'Limited Liability' Act was passed, by which it is provided that individual shareholders shall only be responsible for the amount of their respective shares, independently of the provisions of the Winding-up Acts. In 1856 the Act was *amended*, so that the shareholders in public companies were not indefinitely liable for the debts of the company. In 1859 the Act was still further amended, by enabling all companies, whether in possession of a share capital or not, to take advantage of the Act, and possess themselves of all the facilities afforded.

WINE ETHER, a volatile essence, the produce of spirit of wine mixed in a retort with twice its bulk of sulphuric acid. When this mixture is distilled by the agency of heat, a light, volatile, and fragrant liquid is produced, which is known as wine ether. If a sufficient quantity of nitrate of potash (saltpetre) is introduced into the retort, along with the spirit of wine and sulphuric acid, before the mixture is distilled, a compound ether is produced, which is the nitric ether of commerce. This being a combination of wine ether and nitric acid is very volatile, light, and rather pleasantly odoriferous. (Johnston's *Chem. of Common Life.*)

WINES (xii. 934). In the year 1856 the total quantity of wine imported into the United Kingdom amounted to 9,481,880 gallons, whereof 5,324,324 gallons were white, and 4,157,556 gallons red wine. The total quantity charged with duty for home consumption was 7,365,874 gallons, viz.—4,000,557 gallons of white wine, and 3,365,317 gallons of red; 2,872,960 gallons of red and white wine were exported as merchandise, and on 357,753 gallons drawback was paid for exportation. On the 1st of January 1858, the stock of port-wine in London was 21,613 pipes, being a decrease of about 7500 compared with the average stocks in London. The actual reduction in the shipments from Oporto to Great Britain was 12,000 pipes, but the falling-off in the consumption was not more than a third of that quantity. The stock of sherries was 21,513 butts, being a decrease of 4,997, and the importations had likewise diminished by 22,000 butts, compared with the year 1857.

During the year 1858, the importation of wines of all sorts into the United Kingdom amounted to 5,791,656 gallons, which, compared with the previous year (10,340,094 gallons), presents the large decrease of 4,548,438 gallons; but compared with 1856, the decrease is 3,690,224 gallons. The total deliveries for home consumption of wine of all sorts in the year 1858, were 6,697,146 gallons, which, compared with the same deliveries of 1857—7,044,636 gallons—present a decrease of 347,490 gallons; and the total deliveries for home consumption in 1857, compared with 1856, exhibit a decrease of 320,864 gallons.

Our colonies in Southern Africa are gradually increasing the supply of wine. Thus we find that, in 1856, 254,666 gallons were imported; in 1857, 364,662 gallons; and in 1858, 557,563 gallons.

WISCONSIN, TERRITORY OF. [UNITED STATES, *Suppl.*]

WITNESSES (EVIDENCE, vi. 4-5). In Proceedings in Equity, the evidence of witnesses is no longer confined to written interrogatories, as was formerly the case, but it may now be delivered *vivâ voce*, and be subjected to cross-examination, as in the courts of common law. In the new Courts of Divorce and Probate, which are branches of the High Court of Chancery, the system of personal evidence is in general practice.

For prosecutions carried through the common law courts, a new scale of allowances to witnesses has been laid down, which, in many instances, are considerably less than the old ones. Thus the allowances, at the Assizes and Quarter Sessions, for professional witnesses attending professionally, are, per day, 1*l.* 1*s.*; per night, 2*s.* 6*d.*; mileage, 3*d.* All other witnesses, per day, 3*s.* 6*d.*; per night, 2*s.* 6*d.*; at sessions, 2*s.*, mileage by rail, second class; otherwise than by rail, per mile, 3*d.* Governors of gaols or officers on duty in court for evidence of previous convictions, 3*s.* 6*d.* per day; governors for bringing prisoners under habeas to give evidence, 12*s.* per day; officers for the same duty, 6*s.* per day; mileage, per mile each way, 1*s.*; attorneys for giving evidence, if saving the attendance of another witness, over their allowance as attorney, 6*s.* 8*d.* per day. Constables paid by salary, attending from a distance under two miles, 1*s.* per day; above that distance, 1*s.* 6*d.* per day; per night, 2*s.*; mileage, parliamentary fare, if not entitled to travel at that rate, second-class fare; if otherwise than by rail, for each mile beyond four, 2*d.*

Witnesses attending before magistrates are also paid on a reduced scale. Thus professional witnesses, giving professional evidence in the profession of the law or medicine, and attending from a place under two miles, receive 10*s.* 6*d.* per day; if beyond that distance, per day, 1*l.* 1*s.* For mileage, per mile each way, 3*d.* All other witnesses, if resident within two miles of a magistrate, per day, 1*s.*; if above two miles, 1*s.* 6*d.* per day. If detained more than four hours, although residing within two miles, 1*s.* 6*d.* per day; if detained more than six hours, 2*s.* 6*d.*; for each night necessarily detained, 2*s.* 6*d.*; mileage, otherwise than by rail, per mile, 3*d.*; by rail, second class. Constables paid by salary, for attending for a distance under seven miles, 1*s.* per day; for a greater distance, 1*s.* 6*d.* per day; for each night, if necessarily detained, 2*s.*; mileage, whether paid by salary or not, parliamentary fare; otherwise than by rail, per mile after the first (4*d.*), 2*d.* per mile.

WOOL, and WOOL TRADE (xii. 957). The principal supplies of this useful material are now received from our colonies. Of the 99,315,506 lbs. that were i[illegible] 4,021,254 lbs. came from A[illegible] 53 lbs. from the British E[illegible] 1,285,543 lbs. from our Britis[illegible]h Africa. Of the 127,390,8[illegible] during 1858, 49,142,306 lbs. [illegible], 19,370,741

lbs. from British East Indies, and 14,287,828 lbs. from British possessions in South Africa; making thus 82,874,244 lbs., or considerably more than a half of the whole supply. Of Alpaca wool, 2,359,013 lbs. were imported, showing a deficiency of 615,480 lbs., as compared with the previous year. While our imports showed a general increase, our exports also increased. The most extraordinary feature, in connection with our wool trade, is its extension in the United States, despite the hostile and almost prohibitory tariff which has been there framed for the purpose of excluding foreign woollen manufactures, and of protecting that branch of native trade. Thirty per cent. on the value of English, and we may add German, woollen goods, does not suffice to exclude them from the American markets, or prevent the home manufactures of the United States being undersold.

WOOLLER, THOS. JONATHAN, a well-known political writer, and formerly editor of the 'Black Dwarf,' was a native of Yorkshire, and born in 1777. He was brought up as a printer, but early in life entered on the arena of literature as a political writer of the liberal school. He first commenced a periodical called 'The Stage;' and it is worthy of remark that he was in the habit of setting up his articles in type, without the usual process of writing. During the years 1810-12, he acquired considerable notoriety as a member of different debating societies. In fluency of style, and general knowledge of the topics of the day, few could surpass him. About this time appeared a work called 'The Reasoner,' of which Wooller was both editor and printer; but its existence was very short-lived. He next established a political periodical, with which his name will always be associated, called the 'Black Dwarf.' The articles were so pungent and satirical, especially in their attack on the ministers of the day, that he was at length prosecuted for libel. He pleaded his own defence in one of the most brilliant speeches ever heard, and was eventually acquitted.

During the agitation of the question of Parliamentary Reform, he was elected 'legislatorial attorney' for Birmingham; but the proceeding being pronounced illegal, he suffered imprisonment for eighteen months in Warwick Gaol. On the passing of the Reform Bill he abandoned his political labours, and chiefly devoted himself to the defence of prisoners at the police courts—the fact of his prosecution and conviction having acted as an impediment to his being called to the bar, for which he had eminently qualified himself. He died in Carburton Street, Portland Road, in 1853.

WORCESTERSHIRE (xii. 963-7). According to the census of 1851, the population of the county was 276,926; of which 136,956 were males, and 139,970 females. Of houses, inhabited and uninhabited, there were 58,362. The area of the county was 472,165 acres, or 738 square miles, with 375 persons to a square mile. The population of the principal places was as follows:—

Alvechurch . .	1,600	Bewdley. mun.	3,124
Belbroughton .	1,839	——— parl.	7,318
Blockley . .	2,587	Malvern, Great	3,771
Bredon . . .	1,681	Northfield . .	2,460
Broadway . .	1,629	Oldbury . . .	5,114
Bromsgrove .	4,426	Ombersley . .	2,364
Claines . . .	6,819	Pershore . .	2,717
Cradley . . .	3,383	Powick . . .	1,769
Droitwich mun.	3,125	Redditch . .	4,802
——— parl.	7,096	Rock	1,435
Dudley . . .	37,962	Shipton-on-Stour	1,835
Evesham . .	4,605	Stoke Prior. .	1,613
Feckenham . .	3,254	Stourbridge . .	7,847
Halesowen . .	2,412	Stourport . .	3,012
Hanley Castle .	1,686	The Lye . . .	4,446
Hartlebury . .	1,818	Upper Swinford.	2,728
Inkberrow . .	1,711	Upton-on-Severn . . .	2,693
Kidderminster .	18,462	Wolverley . .	2,441
King's Norton .	7,759	Worcester . .	27,528
Leigh	2,050	Yardley . . .	2,753
Lower Mitton with Stourport	2,993		

WORDSWORTH, REV. DR. CHRISTOPHER, youngest brother of William Wordsworth, the poet (xii. 967), was born at Cockermouth, Cumberland, in 1774. He was entered at Cambridge, where he took his degrees; and in 1802 published 'Six Letters to Granville Sharp, Esq., respecting his Remarks on the Uses of the Definite Article in the Greek Text of the New Testament.' This work obtained him the patronage of the Archbishop of Canterbury, Dr. Manners Sutton, who appointed him his domestic chaplain. In 1804 he was preferred to the rectory of Ashby and Obey-with-Thirne, in Norfolk; and in 1808 he was promoted to the deanery of Bocking, in Essex. In 1809 he brought out his 'Ecclesiastical Biography,' in 6 vols. 8vo.; new editions of which were reprinted in 1818 and 1839. In 1810 he received the degree of D.D. by royal mandate. In 1816 he was appointed rector of St. Mary's, Lambeth, and of Sundridge in Kent, which livings he afterwards exchanged for the rectory of Buxted-with-Uckfield, in Sussex. In 1824 and 1828 he brought out a work, which at the time excited much interest, entitled Εἰκὼν Βασιλικὴ (Icon Basilikē) considered and answered,' in which the writer confidently ascribes the authorship of that work to Charles I. His last work of importance was his 'Christian Institutes,' published in 4 vols. 8vo., in 1837. He died at Buxted, in February 1846.

WRECKS. [LIFE-BOATS, &c. *Supplt.*] The returns of wrecks and casualties for the year 1858 show a small increase in the number as compared with the two preceding years. In 1856 there were 837 wrecks; and in 1857, 866; while in 1858 there were 869. But the number of total losses under those heads exhibits a decrease. For instance, in 1856 there were 368 losses; and in 1857, 384; while in 1858 there were only 354. The number of total losses by collision was 50 against 53 in 1857, and 51 in 1856, while the number of casualties involving damages by the same cause was 251 against 224 in 1857, and 265 in 1856. The number of lives saved during the year 1858 presents much cause for congratulation; for out of 1895 lives in actual peril from ship-

wreck, 340 only were lost, and 1555 saved. Of these latter 206 were saved by lifeboats, and 210 by the rocket and mortar apparatus. [MANBY, Capt. *Supplt.*] The remainder, with the exception of 26 lives (saved by meritorious individual exertion), were rescued by ships, steamers, small craft, and coast-guard boats, and amount to 1113.

WRIGHT, EDWIN GOODE, for nearly forty years the proprietor and editor of the 'Hereford Journal,' and long connected with the charitable institutions of the locality. He was an excellent chemist as well as a general scholar, and ardently devoted to the pursuits of science. In different kinds of scientific apparatus he made many improvements; and several of them, especially those connected with the use of the microscope, have been generally adopted. In 1823 he made the discovery of the advantageous employment of fulminating mercury in the preparation of percussion caps, the great advantages of which were acknowledged by the Duke of Wellington; but by a strange inconsistency, somewhat characteristic of the military profession in their opposition to civilian improvements, his Grace declared that the application of the percussion principle to large artillery was altogether impracticable; although, at the present time, it is adopted by all the armies in Europe. Mr. Wright died at Hereford, at a very advanced age, in April 1859.

WRITING, PICTORIAL, HIEROGLYPHIC, AND ALPHABETIC. [SEMATOLOGY.]

WRITS (xii. 974–5). For *Plaints*, and the proceedings thereon, which have the same effect as writs in the common law courts, and *Writs of Trial*, see COUNTY COURTS, *Supplt.*; and also the Common Law Procedure Act of 1852.

WYATT, RICHARD J., the eminent sculptor, was born in London in 1795. He was a pupil of Rossi, the Royal Academician, and afterwards completed his education under the celebrated Canova at Rome. He executed a great number of works, which are all distinguished by their poetic and classical taste; among others may be noticed 'A Nymph entering the Bath;' 'Shepherdess with a Kid;' 'Ino and Bacchus,' and 'Penelope,' a beautiful statuette executed for Her Majesty. In the Great Exhibition of 1851, many of his works were seen, which excited universal admiration. He died at Rome, where he had taken up his permanent residence, in May 1850.

WYON, WILLIAM, an eminent medallist and engraver, was born at Birmingham in 1795. His father, Peter Wyon, who was of German descent, was a die-sinker of some repute in that town; and his grandfather was the engraver of the embossed silver cup presented to Wilkes by the City of London. Young Wyon's early productions, among others his 'Victory drawn by Tritons,' were sufficient to bring him into notice. In 1816 he came to London, and entered into competition for the situation of second engraver at the Royal Mint. The trial piece was 'The Head of George III.;' and Sir Thomas Lawrence, as the umpire, decided in his favour. Pistrucci succeeded Wyon's uncle as the chief engraver [PISTRUCCI, *Supplt.*]; but differences having arisen between the two, it was arranged that Pistrucci should nominally be the chief engraver until his death, but that Wyon should have half his salary. In 1832, Wyon was elected an Associate of the Royal Academy, and in 1838 a Royal Academician—an honour which none of his predecessors in the same line of art ever obtained. His medals, coins, and seals, include an extensive range of subjects. He executed numerous medals for the Peninsula, Trafalgar, and other victories, both military and naval; and also for many of the leading societies, literary, artistic, and scientific, in England, and on the Continent. His coins comprehend the later ones of George IV., and all those of William IV. and Victoria. In the coins of the two kings, Chantrey's models appear to have been followed; but in those of Her present Majesty he was his own designer. In all these productions, the purest artistic taste and skill are exhibited, which have not failed to elicit universal admiration. He died at Brighton, in Oct. 1851.

X.

XANTHITE (Gr. ξανθὸς yellow), a mineral of a yellowish or light-grey colour, consisting of small round grains, which can be readily separated; specific gravity, 3·20. Its constituents are—lime, silica, peroxide of iron, alumina, and peroxide of manganese.—*Xanthic oxide* is a substance formed in a urinary calculus, which with nitric acid gives a yellow product.

XANTHOXYLA'CEÆ (Gr. ξανθὸς yellow, and ξύλον wood), a natural order of Exogenous plants, consisting of shrubs or trees; of which the *Xanthoxylum*, or Prickly Ash, is the type. The leaves are exstipulate; the flowers axillary or terminal, and the fruit membranous, or in the form of a berry. The bark of *X. fraxineum* is sometimes used in cases of chronic rheumatism.

[The Greek word *zanthos* (yellow) is of frequent occurrence in terms of science, either as a prefix or otherwise; and is always expressive of the colour of the object, whether in botany, zoology, or mineralogy; as *Zanthic acid*, an acid composed of carbon, sulphur, hydrogen, and oxygen; —*Xanthidium*, a name applied to those minute organic bodies, supposed to be Infusoria, which are found in the flint and chalk of some parts of England;—*Xanthine*, a yellow colouring matter discovered in madder;—*Xantho*, a genus of Decapod crustaceans, of the family Brachyura;—*Xanthochymus* (yellow exudation), a genus of plants, of the order Cluseaceæ;—*Xanthogen* (yellow-producing), the radical of hydrozanthic acid;—*Xanthophytum* (yellow-plant), a genus of

plants, of the order Cinchonaceæ;—*Xanthopicrine* (yellow-bitter), a bitter principle obtained from the bark of the plant Xanthophylon caribœum;—*Xanthoriza* (yellow-rooted), a genus of plants, of the order Ranunculaceæ;—*Xanthornis* (yellow-bird), the name of the Baltimore, or Golden Robin, of the family Sturnidæ;—*Xanthorrhœa* (yellow fluid), a genus of plants of the order Liliaceæ, &c.]

XEN'ODON (Gr. strange-toothed), and *Xenopeltis* (strange-shielded), are different genera of Ophidian reptiles, of the family Coluberidæ.

XIPH'IAS (Gr. ξίφος a sword), the generic name of the sword-fish.

[The Greek word *xiphos* is applied to many kinds of animals and plants, when they are distinguished by a sword-like appearance; as *Xiphosoma*, a genus of serpents, including several species of the Boas;—*Xiphopteris* (the sword-fern), a genus of plants of the order Polypodiaceæ;—*Xyphidium* (sword-like), a genus of plants, of the order Hæmodoraceæ, &c.]

XYLOC'OPA (Gr. ξύλον wood, and κόπος labour), the Woodcutter, or Carpenter Bee, a genus of hymenopterous insects, of the family *Apidæ* (or Bees). Their usual habit is to form nests in the dead wood of trees, or in old palings. Cuvier describes them as having thin mandibles nearly spoon-shaped; the labrum ciliated in front, and the upper wings with three complete cubitals. The male, in some species, differs from the female, which resemble great Humble Bees. Their wings are often golden, copper, or violet colour, and very brilliant.

XYLOCOPA, OR CARPENTER BEE.

According to the Linnæan classification, the *Apis violacea* is the type of the order; the female of which forms long burrows and cells in rotten wood; and in each of the cells it deposits an egg and a supply of pollen paste for the nourishment of the young.

[The Greek word *xylon* (wood) is of frequent use in scientific terms; as *Xylite*, the name of the liquid which is condensed from the vapour arising from pyroligneous acid when submitted to distillation from chloride of calcium; composition, C_8, H_8, O_2.—*Xylocarpus* (wood-fruited), a genus of plants, of the order Meliaceæ;—*Xylography* (wood engraving);—*Xyloma* (a wood margin), a genus of fungi of the order Gasteromycetes;—*Xylophagi* (wood-eaters);—*Xylophili* (wood-lovers), a genus of Coleopterous insects, of the family Trachelides;—*Xylopia* (Bitterwood), &c.]

XYSTUS, among the classical ancients, a theatre or covered place, where the Athletæ practised wrestling or other exercises, when the weather did not permit them in the open air. *Xystici* was the name of the Athletæ who engaged in these exercises.

Y.

YARRELL, WILLIAM, F.L.S., &c., an eminent naturalist, was born in Duke Street, St. James's, London, in 1784. He was brought up to his father's business as a newspaper agent, and for many years followed the same avocation. His taste for natural history first developed itself in a love of angling. From fishing he was led to the sport of shooting, and was considered one of the best shots of the day. In the meantime he had devoted his attention to forming some valuable collections of fishes and birds; and about the age of forty he appears to have laid down his rod and gun, and taken up the pen for the purpose of describing the habits and peculiarities of the animals with which he was so well acquainted. In 1825, his first composition, consisting of 'Notices of some rare Birds, observed in 1823-25,' appeared in the pages of the 'Zoological Journal.' In the same year he was elected a Fellow of the Linnæan Society, and in 1827 communicated to the Society his 'Observations on the Tracheæ of Birds, with Descriptions and Representations of several not hitherto figured.' He afterwards contributed a variety of papers, connected with many curious points of natural history, to the Linnæan and Zoological Societies. He also wrote extensively for the 'Zoological Journal,' and the 'Magazine of Natural History.' But the most important productions of his life were his 'Histories of British Birds and British Fishes,' which were published during the years 1830-40. In 1849 he was elected a Vice-President and Treasurer of the Linnæan Society, and during the rest of his life took a prominent part in all the Society's proceedings. He died in September 1856. Mr. E. Jesse, in noticing his death, thus writes:—'Mr. Yarrell was one of our best naturalists. This was shown in his beautiful works on "British Birds and British Fishes," and in several valuable and interesting papers in the Transactions of the Linnæan and Zoological Societies. Mr. Yarrell, as an ichthyologist, solved the problem which had perplexed naturalists from the days of Pliny, as to the history of the eel. He clearly proved that they were oviparous, had scales, and bred for the most part in the brackish water at the mouths of the rivers.'

YENITE. A mineral of a brownish-black colour, which occurs massive and crystallized; specific gravity, 3·99; constituents—protoxide of iron, silica, lime, protoxide of manganese, and alumina.

YORKSHIRE (xii. 995–1005). According to the census of 1851, the population of the entire county was 1,797,995. The population and other statistics of the East, North, and West Ridings were respectively as follow:—

East Riding.

Population, 220,983; of which 109,443 were males, and 111,540 females. Of houses, inhabited and uninhabited, there were 47,327. The area was estimated at 768,419 acres, or 1201 square miles, with 182 persons to each mile: and the population of the principal towns and parishes was as follows:—

Beverley mun.	8915	Howden	2235
——— parl.	10,058	Kingston-upon-Hull	84,690
Bridlington	6846	Market Weighton and Arras	2001
———	2432	Norton	2315
Cottingham	2854	Patrington	1827
Driffield, Great	3792	Pocklington	2546
Filey	1511	Sutton	7473
Heminghrough	2072		
Holme-upon-Spalding Moor	1713		

North Riding.

Population (including the City and Ainsty of York), 261,116; of which (exclusive of the city) 106,710 were males, and 108,504 females. Of houses, inhabited and uninhabited, there were 46,789. The area was estimated at 1,350,121 acres, or 2109 square miles, with 102 persons to each mile: and the population of the principal places was as follows:—

Clifton	2263	Richmond mun.	4106
Easingwold	2240	——— parl.	4969
Fylingdales	1784	Ruswarp	2163
Guisborough	2062	Scarborough	12,915
Hawes	1708	Stokesley	2040
Hinderwell	1736	Thirsk	5319
Kirby Moorside	1835	Whitby	10,989
Malton (New)	7661	York mun.	36,303
Northallerton	4995	——— parl.	40,359
Pickering	2511		

West Riding.

Population (exclusive of the Ainsty), 1,315,896; of which (including the Ainsty), there were 659,619 males, and 665,876 females. Of houses, inhabited and uninhabited, there were 275,272. The area was 1,708,026 acres, or 2669 square miles, with 496 persons to each mile. The population of the principal places was as follows:—

Ackworth	1835	Beeston	1973
Ainsty, *pt. of*	4660	Bentham	2143
Allerton	2041	Bingley	5019
Almondbury	9749	Bowling	13,583
Alverthorpe with Thornes	6068	Bradfield	6895
Armley	6190	Bradford	103,778
Austonley	2234	Bramley	8949
Baildon	3008	Burley	1894
Barkisland	2129	Calverley with Farsley	4892
Barnoldswick	1938	Cartworth	2538
Barnsley	13,437	Castleford	2150
Barwick-in-Elmet	1939	Chapel Allerton	2842
Batley	9308	Clayton	5052
Cleckheaton	5173	Morton	1902
Cowling	2305	Nether Hallam	8897
Cumberworth	2384	Nether Hoyland	2912
Dalton	4310	North Bierley	11,710
Denby	1709	Northowram	15,285
Dent	1603	Ossett with Gawthorpe	6266
Dewsbury	5033	Otley	4522
Doncaster	12,052	Ovenden	12,738
Drighlington	2740	Pontefract mun.	5106
Ecclesall Bierlow	24,552	——— parl.	11,515
Ecclesfield	10,005	Pudsey	11,603
Eccleshill	3700	Rastrick	3917
Elland with Greetland	7225	Rawden	2567
Erringden	2004	Rawmarsh	2533
Fulstone	2257	Rothwell	3052
Gildersome	2126	Ripon	6080
Gisburn, *pt. of*	1927	Rotherham	6325
Golcar	4212	Saddleworth with Quick	17,799
Gomersall	9926	Sedberg	2235
Goole	4722	Selby	5109
Greasbrough	2017	Settle	1976
Guiseley	2572	Sheffield M & P	135,310
Halifax	33,582	Shelf	3414
Handsworth	3264	Shelley	1880
Harrogate	3678	Shipley	3272
Hartshead	1899	Shittlington	1959
Hatfield	1840	Silsden	2508
Haworth	6848	Skircoat	6940
Headingley with Burley	6105	Slaidburn	1682
Heaton	1637	Slaithwaite	2852
Heckmondwike	4540	Skipton	4962
Heptonstall	4177	Soothill	5059
Hipperholme-cum-Brighouse	6091	South Crossland	2784
Holbeck	14,152	Southowram	7389
Honley	5595	Sowerby	7908
Horbury	2803	Soyland	3422
Horsforth	4584	Spofforth	3599
Horton	28,143	Stainland, with Old Lindley	4173
Huddersfield	30,880	Stanley, with Wrenthorpe	7257
Hunslet	19,466	Stansfield	7627
Idle	7118	Swinton	1817
Keighley	13,050	Tadcaster	2527
Kimberworth	6952	Thorne	2820
Kirkburton	3560	Thornhill	2791
Kirkheaton	3068	Thornton in Craven	2202
Knaresborough	5536	Thornton	8051
Knottingley	4540	Thurlestone	2018
Langfield	3729	Tickhill	2087
Leeds	72,270	Tong	2797
Lepton	3592	Todmorden	4522
Lindley-cum-Quarmby	3584	Upperthong	2463
Linthwaite	3802	Wadsworth	4491
Liversedge	6974	Wakefield mun.	22,065
Lockwood	5418	——— parl.	22,057
Longwood	3023	Warley	6408
Manningham	9604	Wike	2916
Marsden	2665	Wilsden	3454
Meltham	3758	Wooldale	5600
Methley	1926	Worsbrough	4250
Midgley	2393	Wortley	7806
Milton, *pt. of*	2203	Yeadon	4109
Mirfield	6966		
Morley	4821		

In 1827 it was estimated that the amount added to the national wealth, by the metallurgical industry of the county of York, was as follows:—Lead, 173,250*l.*; pig iron, 1,013,142*l.*; iron pyrites, 1,572*l.*; coals, 2,168,860*l.*; stones, 105,374*l.*; total, 3,462,198*l.*

YULE (Sax. *yhule*, Scot. *yuill*), among the early northern nations, a name applied to the festive season of Christmas, which is still in use in many parts of England. The origin of the term has been accounted for in different ways. But it appears to have been originally derived from our Saxon ancestors, who called the month of December *Jul-month*; and Christmas formed the great festival, or *Yule*, of the month. On this occasion (as Bourne observes) our ancestors were in the habit of placing a large log upon the fire, which they called the *Yule* log,—a practice still adhered to in the northern and midland parts of England.

Z.

ZAP'OROGUES, the name of a warlike tribe, originally located on the banks of the Dnieper, and from whom the Black Sea Cossacks are descended. They consisted of a powerful military corporation, established towards the end of the fifteenth century. Continually engaged in hostilities with the Tartars of the Crimea, the Ukraine Cossacks founded at that period a sort of colony, near the mouth of the Dnieper, whose special avocation was to guard the frontiers. Their numbers rapidly increased, deserters from all nations being attracted to them by the hope of booty; and their setcha, or head-quarters, on an island of the Dnieper, became celebrated throughout the land for the military services and the valour of its inhabitants. The new settlements on the Dnieper for a long time followed the fortune of the Cossacks of Little Russia. But as their strength augmented continually, they at last detached themselves from the mother country, and became an independent military State. The supremacy of the Czars was imposed on Little Russia in 1664, and from that time the *Zaporogues*, deprived of their allies, and left entirely to their own resources, owned allegiance, according to circumstances, to the Turks or the Tartars, to Poland or Russia; until the rebellion of Mazeppa, in which they took part, led to the total destruction of their power; and they were at last constrained, in 1737, to acknowledge themselves vassals of the Russian empire. After the peace of Jassy, Prince Potemkin, who had formed them into regiments, was so pleased with their valour and fidelity, that he induced Catherine to settle them beyond the Straits of the Kertch, and entrust them with the defence of the Circassian border. They were also granted, along with the peninsula of Taman, the whole territory comprised between the Kuban and the Sea of Azof, extending eastward to the confluence of the Laba, and northward to the river Aia. The Zaporogues then took the appellation of *Tchornomorski-Kussacks*, or Cossacks of the Black Sea; and their organization was assimilated to that of their brethren of the Don.

ZEALAND, NEW (xii. 1010–12). The progress which this important Antipodean colony has made in the arts of civilization, within a very few years, is most gratifying. A short time since the name of a New Zealander was but another term for a cannibal and a savage. It is only a few years since the settlers and the natives were engaged in sanguinary contests. But now, all parties appear to co-operate in the pursuits of agriculture and the arts; and in the principal towns even literature is being extensively encouraged. At Auckland, Wellington, Nelson, Dun Edin, and elsewhere, there are about twenty newspapers, some of them published twice a week. The recent discoveries of gold in the neighbourhood of Nelson, where some valuable nuggets have been taken up, have also assisted in giving a further impulse to the increasing prosperity of the colony. [NELSON, *Supplt.*]

Canterbury is comparatively a recent settlement, situated at the southern extremity of New Munster. It was founded under the auspices of the leaders of the Established Church of England, and about 1849–50, great numbers of emigrants left this country for the purpose of locating at Canterbury, which is now the seat of the newly-created bishopric of the colony. In 1857 the total population of Canterbury was as follows:—Males, 2196; females, 1699: total, 3895. Of that number there were, English, 3390, Scotch, 314; Irish, 162; French, 67; German, 24; other nations, 38. The number of professing members of the Church of England 3225; Roman Catholic, 111; other denominations, 559; dwellings of stone and brick, only 2; of wood, 365; of other materials, 181; stock of sheep, 99,245; of cattle, 6363; of horses, 596; of pigs, 4391.

ZEBU, a bovine animal (the Indian bull), which varies in size from a full-grown bull to a large mastiff. It has usually a hump or fatty excrescence on its shoulders. It is a native of northern Africa as well as of India.

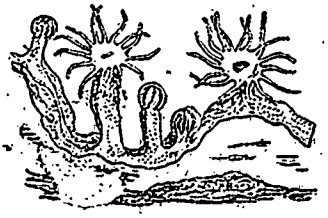
ZE'IDÆ, a family of Acanthopterygious fishes, of the tribe *Microleptes*. The genus *Zeus*, with large heads and oval bodies, is the type of the family.

ZEMIN'DAR. In India a kind of sub-feudatory lord, who collects the government taxes, and possesses a sort of local government.

ZEUXITE, a brown-green mineral, with a vitreous lustre; specific gravity 3·5; hardness = 4·25; constituents—protoxide of iron, silica, alumina, and lime.

ZOAN'THIDÆ (Gr. ζῶον an animal, and ἄνθος

flower), a family of Polypes, or small plants, of which the *Zoanthus* is the type. This family presents some resemblance, in general structure, to the *Actiniadæ*; but they differ in their habits, and appear of a more social character—a number of them being united (says Mr. Dallas) by a common creeping stem which attaches them to some submarine object, and from which new polypes are produced at intervals as it runs along. The annexed is a representation of the genus Zoanthus.



ZOANTHUS.

ZODIACAL LIGHT, a luminous appearance of the heavens of a triangular elongated shape, which is seen nearly in the ecliptic, with its base on the horizon, and its apex at different altitudes. This light is bright and clear when observed in the tropics, but appears very faint and ill defined when seen in the higher latitudes. In explaining the phenomena of the zodiacal light, Sir John Herschel supposes the sun to be surrounded by a mass of nebulous matter, of which this light is a mere manifestation. He illustrates the phenomena by the supposition of an oval spheroid of nebulous matter surrounding the sun, the larger diameter of which coincides with the solar equator. 'If this matter,' says Dr. Lardner, 'consist to any extent of solid masses of small dimensions, they may pass through the earth's atmosphere, on those occasions producing the phenomena of shooting stars; or they may strike the surface, or be drawn down upon it by terrestrial gravitation, and produce the phenomena of meteoric stones.'

ZOOLOGY (xii. 1018). Nothing has tended more effectually to promote the study of zoology, and diffuse a feeling of admiration for the varied works of the great Creator, than the establishment of the ZOOLOGICAL GARDENS, by the members of the Zoological Society. They are situated on the north side of Regent's Park, and occupy a large extent of ground. They are arranged with great taste, and so laid out as best to suit the numerous animals located within them; and at the same time, preserve the picturesque beauties of the whole. They are entered from the road which surrounds the Regent's Park, on the north-west side, and lie on both sides of that road, the two portions being connected by a short tunnel, which passes under the high road. There are two entrances; the south, or principal entrance for pedestrians; and the north, or carriage entrance, between two rustic lodges, upon a line between Portland Place and Primrose Hill. In the interior of the gardens there are inclosures, cages, aviaries, basins, ponds, sheds, monkey-houses, python room, beaver-houses, &c.; with every necessary arrangement suited to the habits and peculiarities of each animal, a list and description of which will be found in the Company's descriptive Guide.

ZOSTERA'CEÆ (Gr. ζωστηρ a riband), a natural order of marine plants, of which the *Zostera* is the genus. They have a great resemblance to sea-weeds, and are commonly known as *sea-wracks*. They are chiefly found at the bottom of the ocean. The *Zostera marina* is a British species, and is sometimes used as a material for stuffing the chairs of the humbler classes.

ZUIN'GLIANS, a branch of Lutheran Reformers, who sprang up at the beginning of the sixteenth century. They were so named from their founder Count Zuinglius, minister of the chief church in Zurich.

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